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Method of Detecting Counterfeit Silver Coin.

If a piece of silver be dipped into a solution of chromate of potash, decomposed by sulphuric acid, (thirty-two parts by weight of water, three of chromate of potash, and four of sulphuric acid), the parts of the silver immersed in the solution quickly assume a purple colour. The colouring is deeper and more lively when the silver is quite pure, and diminishes in proportion to the quantity of alloy mixed with it. Of course this process will not hold good when a coating of silver has been deposited on a piece of white metal, &c.; in such cases as plated or electrotyped articles, for instance, a portion of the coating must be filed off; upon trial by this process, the German silver will remain of a white color. No other metals give the same color as silver when submitted to this test; copper, zinc, &c., are acted upon by the solution, but not colored as in the case of silver.

Sugar of Milk for Invalids.

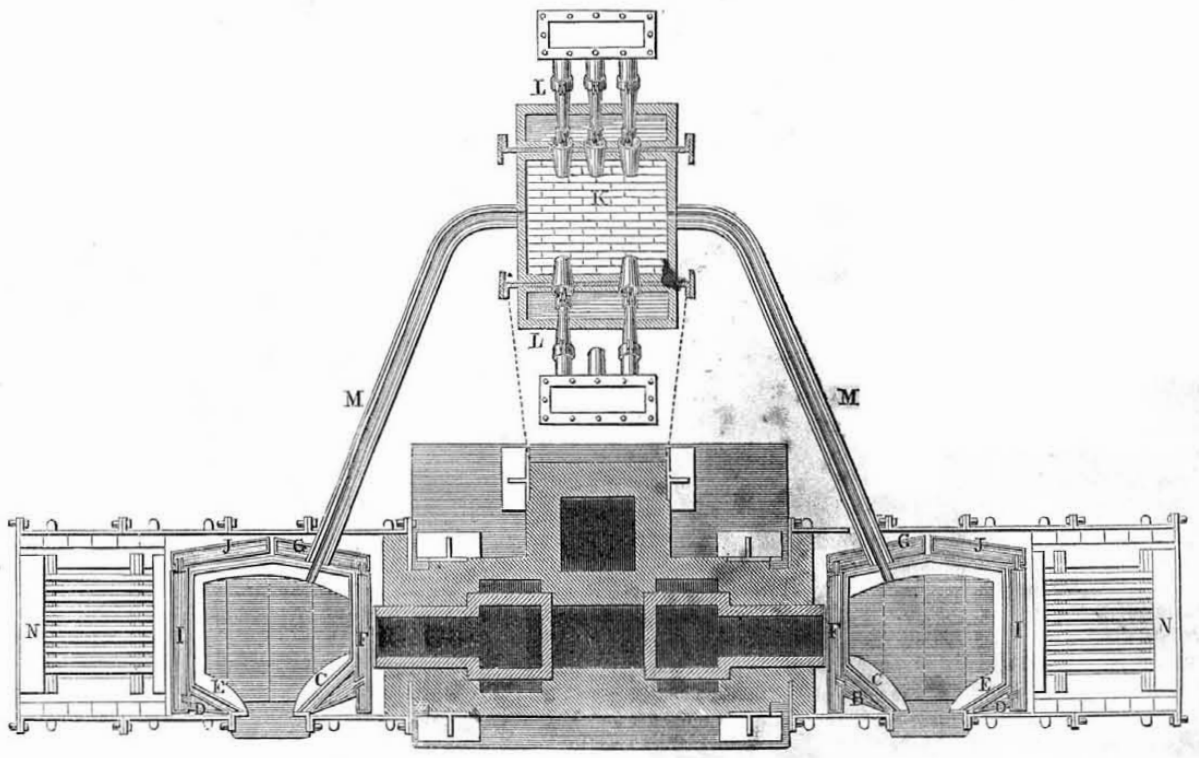
A short time ago Dr. Turnbull, of Liverpool, read to the Literary and Philosophical Society a paper on the use of sugar of milk as an article of food in consumption and other pulmonary diseases. It now appears that whey is coming into extensive use in Germany in the treatment not only of consumption, but also of gout and rheumatism, and that some German physicians entertain opinions as to the beneficial properties of sugar of milk (the ingredient to which whey owes its virtues) similar to those lately put forth by Dr. Turnbull. In the cheese dairies of this country the whey is frequently given to pigs, or otherwise wasted, and the lactine, or sugar of milk, now met with in commerce, is brought entirely from Europe, being prepared chiefly in Switzerland. Its present high price is, however, a great obstacle to its general use as a dietetic remedy; but it is most desirable that so valuable an article of food should no longer be wasted, and that therefore the attention of those engaged in making cheese should be directed to the manufacture of this other product from milk, which must sooner or later become an important article of food and of commerce.

Factory Labor in Rhode Island.

The recent passage of an act by the Rhode Island Legislature, making ten hours a legal day's work, is creating considerable disturbance among the manufacturing villages of that State. Upon the day on which the law went into operation many of the factories were closed the proprietors not being willing to have the law obeyed. A convention of manufacturers has since been held at Providence, and it was decided by them that the operatives should bargain to labor nine hours on Saturdays, and twelve hours during the other working days of the week, or they should not give them employment.

Prof. Silliman, Sen., has resigned his situation in Yale College. His son has been appointed to succeed him. Prof. Silliman has long been a distinguished teacher and writer on scientific subjects. In chemistry he has long held a high place.

IRON REFINING AND PUDDLING FURNACES.---Fig. 1.



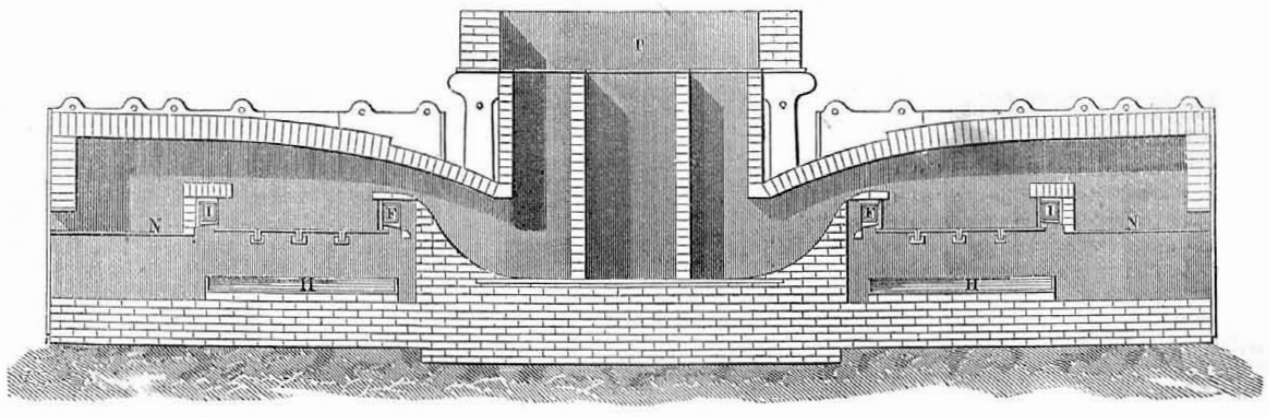
The iron interests of our country are of great and rapidly increasing importance. All information, therefore, relating to improvements, small and great, in the manufacture of iron, is of no small consequence. The iron deposits of our country are on a scale commensurate with its vast extent, and the coal and wood to reduce the ores to metal, are more liberally supplied by the hand of nature than in any other country on the face of this terrestrial ball. The United States of America, are destined to be the greatest iron manufacturing countries in the world, and it is perhaps a great shame to us that they are not so at present. Be that as it may, however, no one can doubt, who is at all acquainted with both the resources and wants of our country. that the day is not far distant when it will be what it now should be.

The annexed engravings are views of improvements in iron furnaces by Joseph Jones, of Bilson, Stafford, in England, an experienced iron maker. They consist, first, of the application of a cooling current of water to a water space, encircling the heated mass in the puddling furnace, to keep cool the materials of which the furnace is composed, and comparatively uninjured during the time it is in operation. Second, the combination of the refining with the puddling furnace by ducts passing between the two, so that the refined metal may flow directly from the chamber on to the puddling hearth, dispensing with the loss of time by removal, &c. Third, connecting the refinery furnace flue with a chimney, to carry off the heated air from the refinery. Fourth, carrying a flue from the refining furnaces into the flues of a stream boiler to use the waste heat of the refinery, and make it available for generating steam for driving an engine.

Figure 1 is a a plan view; fig. 2 is a longitudinal elevation of two furnaces combined together and fitted up on these principles, with the refinery attached. Fig. 3 is a corresponding vertical section of the same.

The water is conducted to the furnace shell by the vertical pipes, A A, fig. 3, which are in communication with a water reservoir conveniently situated for that purpose. The water enters in a cold state into the water space, B, at the back of the flue jamb plates, C, as well as into the water space, D, behind the bridge jamb plates, E. From the space, B, the water passes into the water space, F, between the flue bridge plates, thence into space, G, set near the back wall plate of the furnace, and

Figure 2.



is finally discharged into the tank, H, under the bottom plates of the furnace. The water supplied to the space, D, passes to the space, I, between the fire-bridge plates, and thence into the space, J, near the back wall plates of the furnace. After passing through this course, the heated current is finally received as before, by the bottom tank, H. By this contrivance the whole of the parts exposed to the intense heat of the puddling process, are effectually kept cool, as the passing current of water surrounds every part of the containing shell, and carries off the excess heat, and the warm water can be used as the feed water for the steam engine, or for other purposes. The refinery into which the raw pig iron is put in a broken state for melting, is at K. It is supplied with air blown thrown the tuyeres, L, on two opposite sides in the usual way; and as the metal is melted and refined, it is run out direct into the two puddling furnaces by the inclined pipes or ducts, M M. In this way the metal is at once conveyed to the puddling hearths without any additional trouble. The two puddling furnaces are of the usual reverberating kind, and their grates, N, are supplied with coals in the usual manner, the iron being worked through a side opening, governed by a balanced sliding door, O. The flues from both furnaces pass into the central or intermediate chimney, P, carried on cast-iron framing. The entire furnace is encased in massive iron plates stayed together across the top transversely by tension rods; the fixed guide piece, Q, for operating the door is cast with side lugs, R, which fit into corresponding recesses cast on the main frame plates, a bolt being put through from the upper side, in each case, to bind the whole together. The combination of the refining with an elevated stalk is not represented; neither is the mode of conveying the excess of heat and applying it to a steam boiler; these arrangements and appendages will be easily understood. The application of the waste heated products from smelting furnaces has been applied to steam boilers for a long time, at some of the smelting works in Wales and in Germany, whether many of our iron manufacturing establishments use them or not we do not know—no one that we have visited do so. By the arrangements and construction of furnaces represented, the exposed parts of the furnace are prevented from being rapidly injured by the

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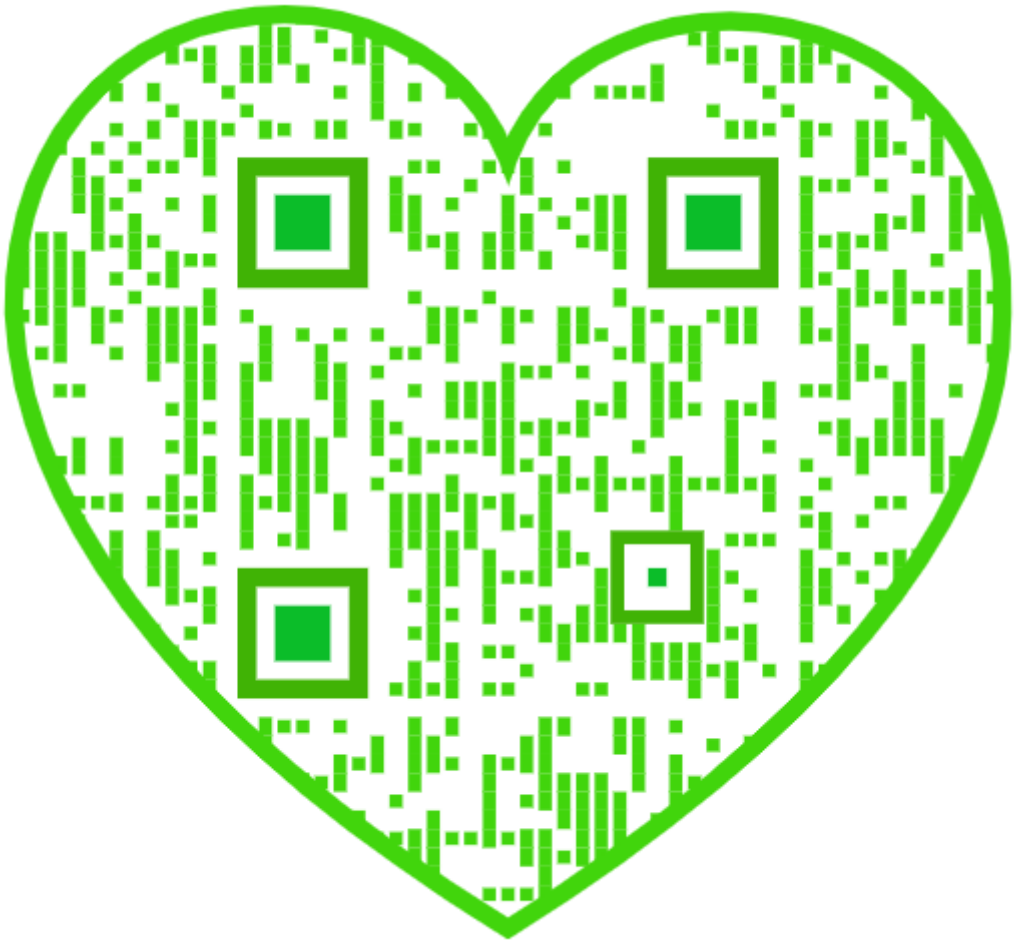
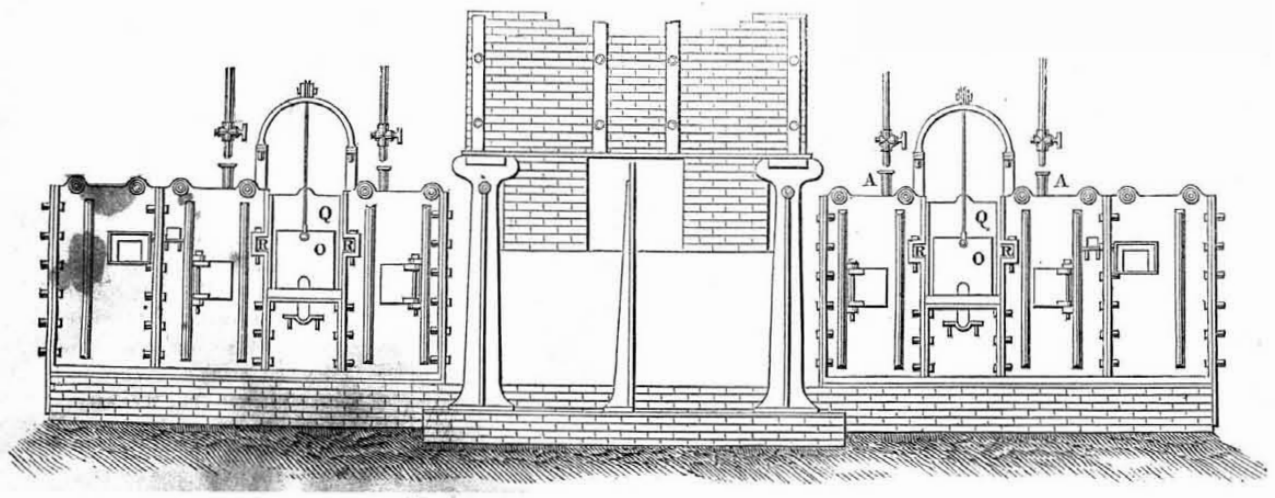


intense heat of the puddling process. The improvement has been patented in England, and the "Glasgow Practical Mechanics' Journal," which illustrates it, speaks of it in very complimentary terms. It says, "these improvements have been in the Monkland Iron Company's Works, in Scotland, for the last twelve months, and the great economy and ease of working which they have introduced, has led other iron companies to make eager inquiries after the plans."

Owing to the high prices of iron which have prevailed for some time, its manufacture has now become very remunerating when it is conducted with ability and skill. We hope that such prices will soon be reduced without any reduction in the wages of the workmen or fair profits to the manufacturers. The reason why we entertain such a feeling is, that we believe the progress, prosperity, and happiness of the people depends greatly on the extensive use of iron. It is our great desire therefore, that our country will soon become the greatest, iron manufacturing country in the world, and that its manufacture may be so improved as to reduce its price and allow of its more extensive use. Every improvement in the machinery, furnaces, and processes for manufacturing iron is hailed by us as a means of benefitting our fellow men.

Figure 3.



THE CRYSTAL PALACE

General Remarks—The progress of improvements in the Palace, during the past week, has been quite rapid and visible from day to day; in many quarters of the building the permanent arrangement of the articles is made; especially the Agricultural Department has an air of completeness. The Machine Arcade and Fine Art Gallery will be ready for the reception of their treasures in a few days.

The Exhibition will realize all the reasonable anticipations that have been formed of it. It will be a tolerable exposition of the industrial resources of the world. If the Palace and its contents could be buried out of sight, till some Layard and Champollion of the three thousandth century should dig it up, our descendants of that late day would find enough in the fossil display to satisfy their most eager curiosity about the olden time. There is a great deal at the Palace to be seen, and much worthy of careful study;—less than a whole day's visit should not be thought of. Upon the whole the Exhibition is quite a creditable affair, especially in view of its being an extemporaneous and private speculation. In an enterprise so large, lapses and imperfections that cannot easily be anticipated will of course occur. Constant vigilance of managers is expected and required, and if abuses are not speedily corrected, censures and complaints must come. We desire to speak as we have hitherto,—whether in praise or reproach, plainly, freely, and impartially.

The Official Catalogue—The Catalogue looks very well—promises to be the right thing. We expected to find it a valuable guide in our wandering, but we soon found that we could not rely upon it. Whose fault is it that many numbers of the catalogue do not correspond with the numbers on the articles—and that many of the articles are not ticketed at all? We heard some bitter complaints from gentlemen who came to study and to learn. But there is to be a new edition of the catalogue and all will be right, they say.

Barlow's Planetarium.—Conspicuous among the objects of scientific interest is an improved Planetarium, the invention of Thos. H. Barlow, of Lexington, Ky. The peculiarities of this Planetarium are the amazing ingenuity and perfection of the machinery by which the motion, position, and phases of the planets for all time—past and to come—are shown. Difficult and tedious problems may be solved by a few turns of the machinery, with a surprising accuracy. There is no other single piece of astronomical apparatus which can so readily illustrate and demonstrate so many interesting facts of the sublime science.

Daguerreotypes—It is generally understood that the best daguerreotypes are produced in the United States: the fame of our operators is world-wide. Orders for American apparatus and American processes are received from all parts of the globe. Even in Paris, the birth-place of the Art, the most extensive and splendid establishment is called "The American Photographic Saloon." The competition on daguerreotypes at the Palace is entirely among our own artists. The number of exhibitors is about forty—all Americans, we believe. The collection of pictures is very extensive, embracing specimens of all the various processes—such as crayon, illuminated, colored, &c. Probably the best daguerreotypes in the world may be found here; and there are many pictures which verify all the extravagancies of those who first described the Daguerrean Art. The beauty and reality of many of these pictures leave nothing more to be desired. Hillotype, even if there were no "stick in the yellow," will be in little demand if operators generally can learn to color with the exquisite taste and skill displayed in the pictures of Gurney and others. There are good pictures by all the exhibitors, but the palm will be borne away by our New York artists. Some of the country gentlemen evidently did not know the men they were to contend with. One of the creditable specimens, worthy of attention, is a panoramic view of Cincinnati, Ohio, from Newport, by A. Bisbee, of Dayton, Ohio, on six extra large plates. Mr. Bisbee has well met the difficulties of the bold experiment, but he should have been more careful in the mercurialization. It is extremely difficult, but not impossible to mercurialize a large plate evenly. The top of the bath should always be considerably larger than the plate. But if the large plates be carefully moved about on the top of the bath during the bringing-out process, we should think the edge might be coated the same as the center portions.

Photographs—Everard Blanquart, of Lille, exhibits "Photographic Illustrations of Various Subjects," in the French Department. These we have not seen, but they are highly spoken of. In the American Department, Whipple, of Boston, exhibits "Crystallotypes;" M. A. Root, of Philadelphia, "Talbotypes," and Hawkins, of Cincinnati, "Solographs." These pictures are produced by substantially the same process. Ample instructions in the art have been published in the Scientific American during the last four or five years. We are surprised that so little attention has been paid to this beautiful art in the United States. On the Continent of Europe Photographs are preferred to Daguerreotypes, and in some cities of Germany Daguerreotypes are almost obsolete. The chief advantages of Photographs are, that they may be easily and cheaply copied, and that there is no disagreeable metallic reflection as in Daguerreotypes. The cost of a single picture is greater than for a Daguerreotype, but when many copies are wanted, they may be afforded at a comparatively small sum. The pictures are bolder and more distinct than Daguerreotypes and may be viewed in any light. Being on paper they may be colored with great facility.

The pictures on exhibition are not the best specimens of the art; some of those we observed are spotted and uneven in tone. But the exhibitors will have the credit of being pioneers of Photography in America. They will introduce it favorably to thousands who have never heard of such a thing. The Messrs. Langenheim, of Philadelphia, were the first to make it a business; their pictures are called "Hyalotypes," and have been exhibited in many parts of the Union in Magic Lantern Exhibitions. Bommer & Rolle, 247 Broadway, are exclusively engaged in the business of Photography, and are preparing some pictures for the Crystal Palace, which will excel anything now on exhibition.

Quackery—In the American Department (where else could we expect it?) we found some very notable contributions to the "Exhibition of the Industry of all Nations;" the names alone, we think, should suggest to our readers, certainly to those who take a country newspaper, or were ever in a flash barber shop, all the needful comments. We took down some of the big words: here they are —"Italian Colornerus," "Chemical Cathairon," "West Indian Tincture and Abification Tooth Powder," "Clierhugh's Tricopherous," "Improved Wahpene," "Anti-Scorbutic Soap Wash," "Rose Bandoline," "Great National Instantaneous Liquid Hair Dye," "Oleophane," &c. &c. The locality is also a depot for distributing the pamphlets describing the magical and all-healing properties of some of them. Supposing the wise Directors had made no narrow restrictions in this branch of industry, we wandered on expecting to behold a gorgeous display of sticking plasters and pills—a mammoth pill—a sixty-four pounder, say—all beautifully gilded, or a pill equestrian statue of General Washington or Daniel Webster. We presume the Directors rejected such articles. What narrow views of things they must take?

Glass—Glass working is one of the oldest of the arts. It is alluded to in the Old Testament, and was one of the unexpected things discovered by Layard in his explorations about Nineveh.

Some of the finest specimens of stained glass are the product of the Middle Ages. But it is only within about a hundred years that glass has been afforded cheap enough to be used by all. Before this time it was a luxury or an ornament. Among the ancients it was a costly rarity, so that a glass cup was a princely fortune, and descended from generation to generation as an heirloom. Glass was the symbol of brilliancy and splendor with the poets.

Its chemical constitution was not understood till the time of Berzelius "the father of chemistry." It was chiefly by his researches that the theory of glass making was made plain. Glass is now classed with the salts. The acid is silicic acid (sand or flint), and the base is one or more of the alkalies, alkaline earths, or metallic oxydes. Glass is then a silicate of soda, potash, &c. The peculiar properties of any kind of glass will depend, of course, upon the base selected, and experience has determined what base must be used for each property. Potash or soda, or both, is the base of all common glass. Lime increases the hardness; alumina the difficulty of fusion; oxyde of lead renders it much more fusible, and adds greatly to the brilliancy and softness.

Glass is colored or stained by the addition of metallic oxydes. The most brilliant but costly colors are a topaz yellow, produced by the oxyde of uranium, and the ruby red by the oxyde of gold. Oxyde of chromium gives a green; oxyde of cobalt, blue, arsenic, white, &c. The ruby red color is generally only superficial. A mass of colorless glass is dipped into the melted color, and becomes coated or plated with it. When brought into the desirable shape by the workmen,—the cup, or whatever it is, appears to be uniformly colored throughout. By engraving or cutting away the colored film, the vessel may be splendidly ornamented.

Next to iron glass the most important material used in the arts. There is no substance which could supply its place. To the chemist, particularly it is indispensable, and there is no civilized man who would not be much embarrassed on being deprived of its use. In a World's Fair, then, this branch of industry should take a very prominent place. We should expect contributions from all the nations where the article is manufactured.

At the Crystal Palace the show of glass, in respect to quality, is very commendable. The coloring and ornamentation are splendid. Nothing but genius and taste of the highest order could have fashioned and engraved those beautiful vases, bottles, and cups, exhibited in the French and American Departments. Glass staining is not a lost art, as the "fogies" tried to prove to us a few years since. Indeed, we believe the Exhibition will show that there are no lost arts. We were tolerably satisfied with the quality but not with the quantity of glass ware. The chief competitors are France, the United States, and Austria. The amount exhibited is not at all commensurate with the importance and condition of the art. About New York City alone there are eleven factories; in many parts of the United States the materials for the manufacture are found in the greatest purity and abundance. Considering the high and deserved reputation of the New England Glass Company, their display is quite meagre and unsatisfactory; they have presented, perhaps, some of the best specimens of their skill; but why not more? And why did not they arrange their wares in better taste, so that they would be seen and appreciated? We are persuaded that they might have made one of the most attractive and instructive displays in the Palace. We expect soon to meet the ingenious professor, Carling, the skillful fancy glass-worker, who has secured a place in the Palace for the exhibition of his wonderful art. The Brooklyn Flint Glass Co., to whom was awarded the prize medal at the London World's Fair, exhibit an assortment of their ware. Plate glass is exhibited only in the few splendid mirrors which adorn various parts of the building. There is a small display of crown glass from Holland, —and in the United States Department a few boxes from the Baltimore Glass Co. Perhaps the 25,000 square feet inclosing the Palace itself, is sufficient to show what may be done in this line. Bohemian glass, celebrated for its heat-enduring properties, and the beauty of its ornamentation, is exhibited in the Austrian and German Departments.

We wanted to see the workmen's tools and specimens of the ware in the different stages of the manufacture—bottles and tumblers half formed, and the huge cylinders and globes from which window panes are cut. Such a display as this would be eminently curious and instructive to most of the visitors.

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On the Manufacture of Cast-Steel, by Dr. Karsten.

(Concluded from page 187.)

Although in the case of pig iron it is necessary to bring it into a liquid state, in order to convert the gray and soft variety into that which is white and hard, or, on the contrary, the former into the latter by rapid or slow cooling of the metal, in the case of iron with a smaller per centage of carbon or steel, mere rapid or slow cooling, without any previous alteration of the state of aggregation, is sufficient to convert the darker colored soft steel, into the whiter hard steel, and the reverse. Judging from analogy, therefore, it is highly probable that the changes in the state of combination of the carbon and iron take place in the hardening and softening of steel, corresponding to the different states of combination of this element in gray and white iron, although these differences in the state of combination have not yet been proved by chemical evidence to exist in the case of steel as they have in raw iron. However, the hard and soft steels have never been regarded as special varieties, and there is no greater reason for regarding white and gray pig iron as special varieties, because the differences in color, hardness, and tenacity are owing solely to the respective states of combination determined by conditions of temperature, and not to any alteration in the combining proportions. If however, gray and white iron are regarded as special varieties, in the same manner as graphite and diamond, it must not be forgotten that a perfectly analogous relation exists between hard and soft steels, which are not regarded as special varieties.

In the processes employed for decarbonizing pig iron and converting it into steel, it has not hitherto been possible to obtain a product of perfectly homogeneous nature. It is always necessary to sort the steel, in order to separate the harder parts containing more carbon from the softer, and these again from the steel-like iron. This absence of homogeneity in the product, resulting from the imperfection of the processes, led to an attempt to give the steel great uniformity of texture by melting. The so called cast steel is really a much more homogeneous and trustworthy product than the raw steel, or that obtained by cementation, although its characters likewise depend upon the proper and careful selection of the material from which it is made. In consequence of the fact, that steel may be prepared by fusion, which, together with a large per centage of carbon and consequent hardness, possesses homogeneity whatever may be the degree of hardness desired, cast steel has acquired such a well-merited reputation, that it is now always employed for articles in which great hardness is indispensable. However perfect the process for making cast-steel may appear to be, it is still open to the disadvantage, that the selection of the suitable material must be entrusted to the judgment of the workman, and consequently that however homogeneous the product, the per-centage of carbon, the hardness and solidity of the steel cannot be determined with precision beforehand. Such imperfections in the practice of metallurgical operations are in every case unavoidable, when determinations of weight must be replaced by the practised eye of the workman. The per centage of carbon in the material employed in making cast-steel—cementation-steel—is different in every part of the section of the bars, so that the average per centage of carbon in the charge of a crucible and the product of the casting cannot be determined with precision. Although the hardness of the English and good German cast-steel correspond tolerably well with that which is required, this result is solely attributable to the perfect acquaintance of the workmen with their materials, and their careful selection of it for this practical purpose.—There would be no uncertainty as to the result, if we possessed a material applicable to the preparation of cast-steel, in which the per centage of carbon could be calculated. The white pig iron made from pure spathic and brown iron ores free from disseminated copper pyrites, and the per centage of carbon in which may, without any considerable error, be assumed as 5·6, is a material of this description. The per centage of carbon in the best kinds of Swedish bar iron, and the iron which is made in Germany from the pure spathic and brown iron ores, may very safely be assumed as 0·25 on the average. The above pig iron and this bar iron are the purest kinds known, containing only traces of silicon, from which likewise the cementation steel used for making cast steel is never free. Both these kinds of iron are therefore of such a nature as to enable the operator to determine beforehand with precision the per centage of carbon in a crucible-charge, and to produce cast-steel of any desired degree of hardness by means of a simple calculation of the requisite proportion of the two kinds of raw material. If the per centage of carbon in the melted product obtained in this way, and the characters dependent upon that per centage, should be found to agree perfectly with calculation—a question to be determined only by experiments on a large scale—it might be expected that the production of cast steel from these materials would constitute a new phase of this branch of industry in Germany; for besides the trustworthiness of the operation, by which cast-steel could be made of any desired degree of hardness and tenacity, it possesses economical advantages in the cheapness of the raw material.

But the production of cast-steel by melting together white iron and pure bar iron appeared to be liable to an objection far greater than that founded upon the impurity of the raw material, and this arose from the doubt as to whether the product of the fusion would be homogeneous. However, the question of practicability could only be decided by direct experiment. Such experiments were made in the years 1846 and 1847.

The melting crucibles employed were of such capacity, that from 30 to 35 lbs. could be melted at a time. The melted metal was as usual run off into cast-iron moulds. The following is a brief statement of the results obtained in a great number of meltings, and the subsequent treatment of the cast-steel:—

1. In the selection of the pig iron, it is of great importance to employ such as presents perfect lamellar structure, and not such as is partly fibrous or compact. The use of lamellar iron is necessary, and not only in order that the per centage of carbon in the charge may be calculated with accuracy, which cannot be done with fibrous or compact iron in which the per centage of carbon varies greatly, but likewise and especially because the lamellar iron exercises the greatest solvent action upon the bar iron, so that even a comparatively much larger quantity of these kinds is but an imperfect substitute for the lamellar iron. Consequently good cast-steel cannot be produced in this way without lamellar pig iron.

2. The extremely high temperature which bar iron requires for fusion appeared to render it necessary that it should be added to the charge in small fragments. On this account the first fusions were made with bar iron, which had been rolled into moderately thick sheets and then cut into pieces. However, it was subsequently ascertained that the solution of the bar iron in the liquid pig iron takes place without any difficulty, and that the product is equally good when thick pieces are used, so that finally masses of a cubic inch in dimension were employed. By this means the expense of cutting the bar iron is obviated; at the same time the iron is less oxidized, and less room is taken up in the crucible, than when it is in small fragments.

3. In order to produce a homogeneous cast-steel, the highest possible temperature is necessary for the fusion. Consequently very infusible crucibles, which are not liable to crack, are a much greater desideratum in the production of cast-steel from pig and bar iron, than even in the melting of steel itself. Of course the greater the number of meltings which can be made in one crucible, the greater is the economical advantage gained.

4. The melted metal must be run off into the cast-iron moulds as rapidly as possible, in order that the whole mass may cool uniformly. At the same time care must be taken that none of the slag is allowed to pass from the crucible into the moulds, for there is not time for the slag to separate from the metal; it solidifies in the midst of the steel and renders the casting defective, and causes the bar to rend in rolling. This may be most advantageously obviated by taking the cover from the crucible while it is still in the furnace, and skimming off the slag with a ladle-shaped iron. The small quantity which then remains may easily be kept back in the ordinary way during the casting.

5. The cast-steel, when allowed to cool slowly in the crucible, loses all coherence, and breaks down under the hammer or rollers. The cause of this appears to lie in the formation of carburets of iron, which do not remain combined with the rest of the steel containing less carbon.

6. The cast bars must, after they have cooled, be freed from all adhering granules of metal by means of a chisel. If this is neglected, the edges of the bars become broken in rolling.

7. In heating the cleaned bars for the purpose of further working, a bright red heat must be employed. This cannot be effected in a satisfactory manner before a blast, because the temperature is not sufficiently uniform, and a uniform heat is indispensably necessary for the favorable result of the rolling or hammering. This can only be effected in a well constructed reverberatory furnace, and most advantageously in one fed with gas, a slight excess of which is present.

8. It is preferable to roll the heated bars rather than to hammer them; but if a hammer is used it must be of considerable weight.

9. The cast bars presented a perfectly homogeneous appearance, even after rolling.—The bars were first rolled out square to a length of 4 feet, and then, after reheating brought into the desired form. They admitted of being rolled into the thinnest sheets without cracking at the edges.

10. Even in making soft steel, for which purpose the crucible was charged with 25 lbs. of bar iron, and 2 lbs. of pig iron, a perfect solution of the bar iron was effected by means of a strong heat. The product was a homogeneous steel, although, according to calculation, it could not contain more than 0·6 per cent of carbon. The best, hardest and most tenacious steel was obtained by fusing mixtures in which the calculated per centage of carbon was 1·5 or 1·6. For this purpose the crucible was charged with 24 or 25 lbs. of bar iron and 8 lbs. of pig iron.

11. The cast-steel, even that which is soft, and in which the per centage of carbon is only 0·6, differs essentially from the raw or melted steel from the circumstance that it cannot be welded without great difficulty. With a higher per centage of carbon it can only be welded under a coating of borax. With a per centage of 1·25, it can no longer be welded at all. Although, on the one hand, this behavior of the cast-steel obtained in this way indicates its homogeneity, still, it is a defect, one indeed which is likewise possessed by the English cast-steel in a somewhat less degree.

12. The cast steel bears only low tempering heat, and acquires a very high degree of hardness, although at the cost of its tenacity. The proper mode of tempering it still remains to be ascertained.

The steel may be used for making the finest kinds of cutlery for files and chisels. For all purposes in which it is submitted to sudden and violent blows, it has proved destitute of the requisite tenacity. While very hard, it possesses considerable brittleness.

14. The last mentioned character of the steel affords a ground for doubting its certainly apparent homogeneity, and this conjecture is confirmed by the fact, that its tenacity and capability of being welded are considerably increased by remelting. If, however, it should prove to be impossible to produce a good cast-steel in one melting, the economical advantages of this process would probably be altogether lost.

Ice Houses.

Messrs. Editors—I want to construct immediately a small ice fixture in my cellar for family use. My cellar is 44 by 40 feet, and 8 feet high; the wall is split granite, with a plank flooring; it is pretty dry. I would prefer placing it in the north corner. Here is my plan:—I would first line off upon the cellar corner floor 8½ feet square; within this space stud up a room 6 feet 2 inches, with 4 inch joist and board up upon the inside. This room is then 6 feet square and 8 high which is to receive the ice; pitch this room all round upon the outside to keep moisture from getting in or out, then board up upon the studs which leaves a 4 inch space all round between studs; then stud up again on two sides, and plank up, the other two being formed by the stone wall), 15 inches from the inner studding. This 16 inches of space all round to be filled with dry saw-dust (perhaps wet saw-dust would do as well.) For convenient ingress to this fixture, I purpose to fit in, near the bottom, a box or case about 7 feet long, one foot deep, and 2 wide, to extend from the outside through the ice room; the ice is to be lowered in from the top and packed in and around this pitched case, which has double doors lined with cloth; in this case is to be a provision chest to move in and out easily upon rollers; this chest is to be in separate apartments, for the reception of fruit, butter, meats, &c. But instead of this horizontal case and chest, I could insert them in a vertical position under the hatchway at less expense, although it would be more inconvenient in getting the chest in and out; then again I should not have so compact a body of ice. What do you think of it? Will it answer? Is the horizontal or the vertical way best? Am I right in leaving the 4 inches air space? Should the saw-dust be wet or dry? Will moving the provision chest in and out once or twice a day melt away the ice too fast? C. J. F.

North Lincoln, Me., 1853.

[This plan of an ice house we consider is an excellent one; the saw-dust should be *dry*. The air space is a good idea, and we would prefer the horizontal drawer. There should be some allowance below for drainage.

The Birmingham of America.

Waterbury, Conn., is the Birmingham of America, as it regards the kind and extent of its manufacture. It is situated in the beautiful valley of the Naugatuck, embosomed among the hills, built on an extensive scale, affording room for gardens, shrubbery, trees, &c., in connection with the dwellings, and a public square in the centre. This town was settled in 1677. For thirty years previous to the introduction of manufactures, the population rather diminished. The first water-wheel was put in motion about the beginning of the present century. For a number of years the manufacture of clocks was the principal business of the place. In 1802 the manufacture of gilt buttons was commenced, a business which has tended to develope the resources of the town. In 1810 the manufacture of woolen goods was introduced, and in 1837 that of the lasting or covered button. There are now over thirty companies, embracing more than two millions and a half of capital, engaged in the manufacture of brass, copper, plated metal, German silver, suspenders, and webbing, hosiery, cutlery, felt cloth, pins, hooks and eyes, buttons, umbrella trimmings, files, dressed leather, buckles, shawl pins, jewelry, &c., and in the mercantile business, connected with them. The town contains seven thousand inhabitants. It has its water-works, furnishing the sparkling pure water from a spring on the hill, so high as to run in the upper stories of the hotels. It has also its gas works and other appendages of our sea-board cities.

By the news from various places we perceive that the heat has been nearly as oppressive as in New York City, but not so fatal because there is such an eternal driving in sunshine and storm here, to advance in the world of evil spirits.

To a weak mind a name is of more consequence than the thing itself. This has been manifested by one of our cotemporaries, by an exhibition of spleen against the People's College, because it was not named an "Industrial School."

A correspondent in a cotemporary in writing about navigating the air, says, "if it is within nature's law, it is practicable at the present moment, if not it is impossible."—Bright idea this; ask the birds if it is within nature's law; and John Wise if it is possible.

Two young men in Danvers, Mass., recently pegged 160 pairs of women's shoes in ten hours. One Alex. Steel pegged 82 pairs, J. Bunker, the challenger, 78 pairs—beat by 4.

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NEW INVENTIONS.

Regulating the Speed of Steam Engines.

Luther R. Faught, of Macon, Georgia, has invented a very ingenious and original improvement for regulating the speed of steam engines, by cutting off the steam in the steam box when it exceeds the established velocity. The speed of the engine is regulated by the "cut-off," which consists of a plate of metal placed to fit and work on the back of the slide valve, which is furnished with certain openings through which the steam must pass into the cylinder while the cut-off plate is in a proper position. The form of this cut-off is not new, but the method of operating it is peculiar: the cut-off is caused to move with the slide valve by means of friction produced between them by suitable means, and by attaching the rod of the former to a pendulum axis or other device capable of offering resistance to its movement, which causes it, when the velocity increases to move a shorter distance than the slide valve and thus close the steam openings of the valve, and cut off the steam before the termination of the stroke of the piston. The steam passages of the slide valve are closed earlier or later, according to the velocity of the piston, by the action of this governor valve, to regulate the speed of the engine. The governor valve is therefore operated by resistance which increases as the undue velocity of the engine increases, to cut off the steam early when necessary. Measures have been taken to secure a patent.

Improved Metallic Hub.

An improvement has been made in metalic hubs for wheels of vehicles, by J. B. Hayden, of Easton, N. Y. The improvement effectually prevents the spokes from working in the mortices of the hub, by any lateral movement —an important consideration. In the hub these spoke mortices are cast in two separate parts, forming two sections; and there is a thin ring plate secured in the hub between them. The lower ends or shoulders of the spokes have thin grooves (one in each) cut into them, into which the thin plate ring fits, and the tennons of the spokes pass into the mortices on each side of the plate, in such a manner as if one spoke fitted into two mortices in the hub, with a binding ring or key between them, rivetted to the spokes, thus effectually preventing them from working loose in the hub. Measures have been taken to secure a patent,

Cast Iron Driving Wheels.

Henry A. Chase, of Boston, Mass., has invented an improvement in cast-iron driving wheels for locomotives, which consists in casting the "counterbalance" in a double-plated chilled wheel opposite the crank-pin in the inner face of the tread, between the two sides, but not touching them. It is cast on the tread, and stands up from it in the hollow part of the wheel, like a plate, but is not attached to the hub. The plates of the wheel, therefore, are made of equal thickness throughout, and consequently when cast they contract equally. The counterbalance, or solid plate, cast opposite the crank pin, inside of the wheel, is therefore free to contract without affecting the side plates after being cast. Measures have been taken to secure a patent.

Improved Lime Kiln.

H. D. Mandeville, of Cedarburg, Wis., has taken measures to secure a patent for an improvement in lime kilns. The fire places and heating flues are arranged around the shaft of the kiln in such a manner that the fire doors are all brought to one side or front of the kiln, but the heat is distributed into the shaft all around by the flues which are so arranged that they can all be cleared through the fire-doors. The fire places are constructed with spaces or chambers in the masonry above, whereby they are relieved of the weight of wall, and are more easily repaired when required.

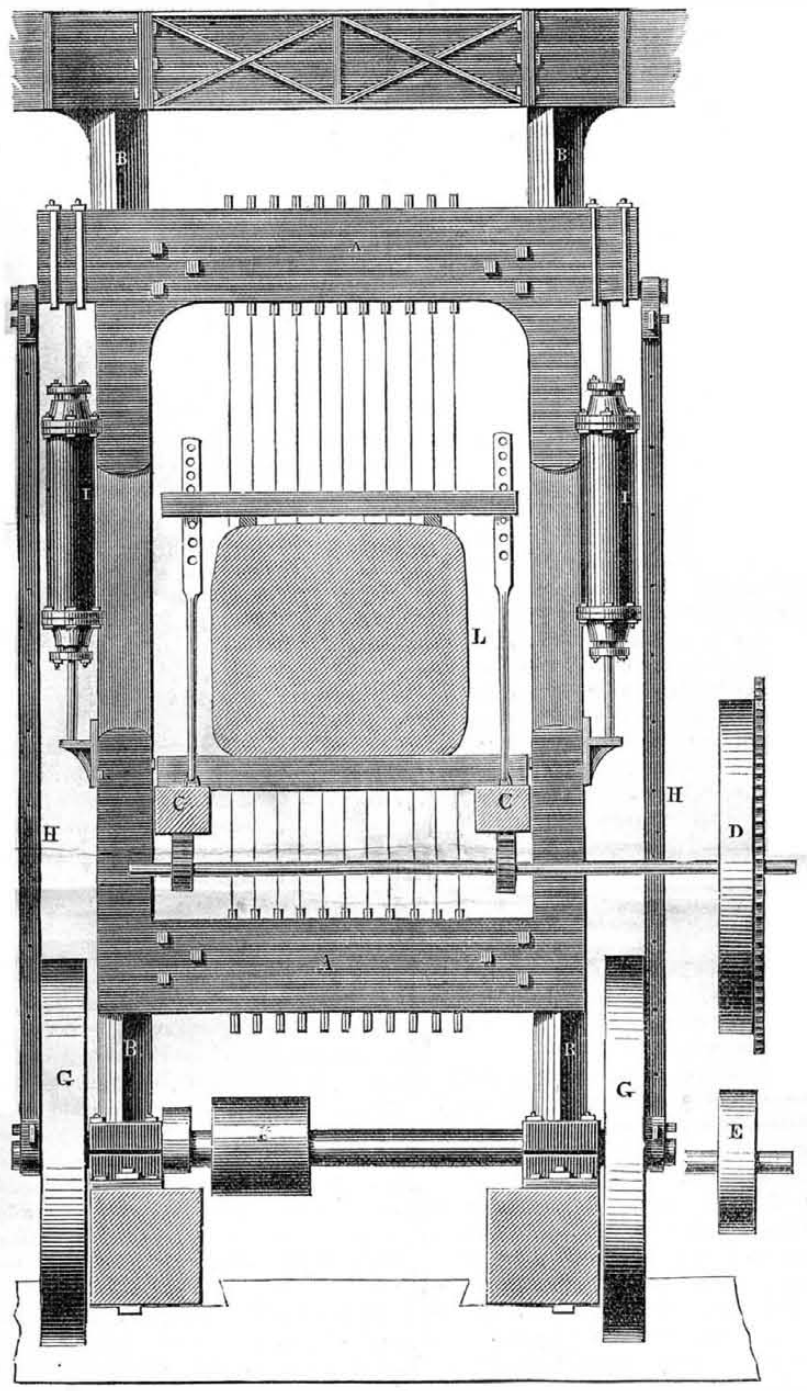
New Corn Crusher.

Thomas Durden, of Montgomery, Ala., has taken measures to secure a patent for a new corn crusher, which is exceedingly well adapted for cracking and crushing corn in the ear, also various other vegetables. The hopper for the reception of the corn is peculiar; it receives the ears of corn by various small openings; they pass down and are first cut by a revolving S-shaped knife on a vertical spindle, and after that they pass down and are crushed between grooves and projections on the revolving spindle, and grooves and projections on the inner face of the machine. The grinding parts are of cast-iron, the inside of the case being a hollow cone, its bottom where it discharges being the apex, and the grinding spindle or muller acting with its outer on the inner surface of the case. The apparatus is simple and good.

Improved Heating and Steaming Apparatus.

Jesse Neal, of Hudson, Ohio, has invented an improvement in apparatus for heating and steaming purposes. It is intended, principally to be used in a dairy for the heating of milk to make cheese curd. Its adaptations are directed and intended principally for this purpose. Measures have been taken to secure a patent.

BROWN'S IMPROVEMENT ON SAW MILLS.



The annexed engraving is a view of an improvement in saw mills, invented by Isaac Brown, of Baltimore, Md., for which a patent was granted on the 19th of last month. The improvement relates to gang saws.

The engraving represents a front view of the saw gate, with a log passing through the mill.

A A is the saw gate; B B are the fender posts; C is the carriage with a log, L, on it, which is being carried through the mill and sawed into planks by the gang of saws in the frame; D is a rag wheel and backing pulley, E being the pulley to back the carriage; G G are fly wheels with pins set eccentric, forming cranks; they are attached to the connecting rods, H H; I I are steam cylinders firmly secured to the fender posts in such a position that the centre of the piston rod is in line with the centre of the cross section of the saw cross head. The saw gate is made in the usual way, except the top cross girt, which is projected over the sides sufficient to let the piston rod press against it in its upward motion. The piston rod is secured to the cross girt by adjustable stirrups, and the connecting-rod pin projects over the cross girt, so as to allow the said rod, which is attached to the fly wheel, G, to work clear of the cylinder.—There is also a piston rod extending through the bottom of each cylinder, which is attached to a bracket on the side of the saw frame, to press in the downward motion of the piston on the bracket, and give motion to the saw frame. Owing to this mode of connecting the piston rods with the saw frame, the vibrations of the latter are not communicated to the piston to make it wear out of line in the cylinder. The claim of the patent is for this mode of preventing the vibrations of the saw frame wearing the piston untrue and out of line. The shaft for the fly wheels is firmly secured at the bottom of the frame, and runs in suitable boxes. The fender posts are constructed in such a manner as to form guide slides for the saw frame. It is best to make the saw gate of wood and boiler iron combined, the iron being so cut as to project up and down upon each side piece, making a cross frame side to side, all rivetted securely together,—allowing an opening in the bottom and top girts to hang the saws in, and made of a strength according to the number of saws to be employed. Each cylinder has a stuffing box on each end, and the piston rod is guided so as to work truly through the cylinder.

The carriage, or feed rollers to forward, the timber to the saws for feed and back motion, may be applied with equal advantage according to the kind of lumber to be sawed. For flooring boards, or white pine boards, using circular saws for edging, the feed rollers will be the most expeditious mode of manufacturing lumber. For ship plank, and bill timber, the carriage may be considered the best, either with constant feed or rag wheel. Six inch steam cylinders of twenty feet stroke will be sufficient to work a gang of fifteen saws for sawing ship planks. Eight inch cylinders of twenty-four inch stroke, will drive from 30 to 40 saws, cutting flooring inch boards edged by circular saws. The fly wheels are about 4 feet diameter, and weigh 1,000 lbs. each. Their faces are turned to receive a belt to work the shaft of edging saws. One steam cylinder of 6 inch bore, and two feet stroke will drive a saw hung on each side of it; a separate carriage being provided for each, two logs may be fed into the saws at the same time.

These mills are very portable, they can be put up in a short time, and Mr. Brown informs, us they can be furnished at half the cost of other mills, which will do the same amount of work. They require less hands to operate them, and with a steam boiler and the frame and appendages as represented in the above engraving, there is at once a handy and convenient steam saw mill. Orders for these mills are filled by Messrs. Stillman, Allen & Co., of the Novelty Works, this city, and more information may be obtained by letter addressed to Mr. Brown, No. 90 South Exeter street, Baltimore.

The Ericsson not at the Crystal Palace.

About two weeks ago one of our city papers, stated that a beautiful Ericsson engine was to be on Exhibition, and spoke of it in the most flattering terms, as something which would astonish the public and more than prove all the high flown panegyrics paid to it previously by the same paper. On Thursday last week, the same paper published a communication stating that the application for space in the Crystal Palace for the said engine had been *withdrawn*. This is true, as we have learned by special inquiry at the office of the Crystal Palace Association. The Superintendent of Machinery, Joseph E. Holmes, Esq., a practical engineer, designed to test the power of the Hot Air Engine by a dynometer, and to weigh the amount of coal to propel it. We could not learn what the reasons were which induced the builders of the Ericsson engine to withdraw the application,—we present the fact and can draw an inference —so can every person who reads this.

Steamboat Inspectors.

Since the letter and remarks respecting Steamboat Inspectors were published in No. 47, Charles W. Copeland, the Chief Inspector of this district (not Robert L. Stevens,) presented us with the new act relating to steamboats, printed at Washington. Section 42 of it excepts ferry boats, tug boats. and towing boats, and all steamers under 150 tons burden—these do not come under the provisions of the act. The Inspectors he informs us have done all they possibly could to carry out the law promptly and efficiently, but have been much troubled because other governmet officers have not done their duty in furnishing them with proper instruments.—We have received a communication on this subject, which we will publish next week.

For China.

Mr. Walker cannot proceed on his mission to China, because there is not a steam frigate in our navy—at home—fit to carry him.—He should take the overland journey. Where is Mr. Porter with his aeroport? Here is a fine opportunity for him to do his country some service. Let him carry Mr. Walker in his balloon at once to the seat of the war among the Celestials, and bring back a cargo of the best see-oo-chop-shong, to pay all expenses.

Another Steam Boiler Explosion.

On the morning of the 11th, the flue of the steam boiler at a foundry in West Troy, N. Y., collapsed and killed the engineer Henry, and his brother David Paul. A number of others were severely wounded. The engine was stopped when the accident took place. Over pressure was the cause of the accident.

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Scientific American

NEW-YORK, AUGUST 20, 1853.

Patent Law Suits—Sewing Machines.

A suit for libel has been commenced against the "New York Tribune," by Elias Howe Jr., the patentee of the first machine for using a needle and shuttle in sewing. The suit is instituted because the "Tribune" published the advertisement of I. M. Singer & Co., owners of the Singer Sewing Machine. That advertisement stated that "E. Howe had published falsehoods in saying that he (Howe) had obtained an injunction against Singers' Sewing Machine." It also stated that "it was equally untrue that Howe had the original sewing machine," and it invited all to come and examine the original one, made twelve years before Howe's was heard of; asserting at the same time, that it was the invention of Walter Hunt, of this city. E. Howe, Jr., obtained the first patent in America, for a machine which used two threads and made the lock stitch. In a trial which took place at Boston, Howe vs. Le Row & Blodgett, for an infringement of the plaintiff's patent (see page 356, Vol. 7, Scientific American) the claims of Walter Hunt to the invention of the shuttle and needle sewing machine were introduced, but were considered of no importance, and the plaintiff gained the case. The claims set up for Hunt's machine are a forlorn hope, and when Mr. Le Row, before his suit commenced, informed us that he relied on such claims, we told him that his case rested on a sandy foundation; the result in that case strewed such claims to the winds.

We certainly do not think that Mr. Howe is justified in suing the "Tribune" for libel, but neither was it right for that paper to admit the advertisement of Singer, containing, as it did, such pointed and offensive language. The "Tribune" stated "it did not believe there was a man mean enough to sue them for libel under such circumstances, nor a lawyer to be found mean enough to undertake the case." The "Tribune," we believe, never intended to hurt Mr. Howe's feelings nor injure his business, but lawyers can be found to advise almost any measures, to make the "penny fee." The Hon. Wm. H. Seward, U. S. Senator, is Mr. Howe's Counsellor in patent matters, but with this case of libel he may have nothing to do.

This case affords another illustration of the defectiveness of our United States Chancery Courts with their miserable old and complicated slow machinery. The means for trying and deciding disputed patent cases should be ample and rapid in bringing them to a conclusion; instead of this, there is the same see-saw snoringly-draw system in existence now that there was fifty years ago. Some patent cases before our United States Courts might well be represented by a snake with its tail in its mouth endeavoring to swallow itself. The case must first appear in equity and then eminent lawyers must speak on it for three or four days, going over the whole history of the invention; then it may be carried before a jury, and then up it will go, perhaps at the end of fourteen years, to the Supreme Court at Washington. When application for an injunction is made to a judge, on a patent which has never been tried at common law, he should at once, if it is demanded by the defendant, order a trial at the next session. This course would save much to patentees, and soon bring the matter to a conclusion. It would also save the public from being inflicted with such quarrels as those of Howe and Singer, Goodyear and Day—the india rubber case—not yet terminated, we believe. Among the many new inventions which are still wanting to benefit mankind, we recommend inventors to try their genius and skill in improving our United States Courts in patent trials.

Can you Recommend the Scientific American?

We hope our readers will not overlook the splendid prizes offered for the largest lists of subscribers—for $1,40, to clubs of twenty and over, a journal can be procured abounding in valuable information upon every branch of industry. Those who have taken the Scientific American need no urging, but we should regard it as a great favor if our subscribers would call their neighbors' attention to it. Can you not recommend it as a paper of rare usefulness? Do so if you can. Twelve persons are to secure cash prizes payable on the 1st of January next, that time is not far off. We hope not only to profit ourselves, but also to profit all who will become readers of our paper and competitors for the prizes. We have but two agents, B. S. Hill and J. C. Bartlett, who have any authority to canvass for subscribers, these gentlemen we know to be reliable and trustworthy. It is our intention to dispense as much as possible with the travelling agency system. We therefore offer prizes of sufficient value to induce our readers to canvass for subscribers in districts where they are known and not distrusted. Subscribers can be sent in at any time until January 1st in competition for the prizes. We do not require that they shall all come from one place, we will mail the paper to any address required. Last year John Marston, an industrious mechanic, of Saratoga Springs, secured a prize of $60 for his efforts in procuring subscribers to this paper, he assured us that he had very little trouble in obtaining them. It should be understood that our local or travelling agents are not allowed to compete for the prizes.

Railroad Accidents---The Remedy.

On the 10th inst. a terrible collision took place on the Camden and Amboy Railroad, New Jersey, between the train from New York and the one from Philadelphia, by which four persons were killed and seven others wounded. On the New York and New Haven Railroad the next morning (11th) the night train came in contact with a mass of rock which had rolled down on the track, by which the engineer was killed and the fireman severely wounded. The Coroner's Jury in the case of the New Jersey collision inquest, was composed of no less than twenty-one persons, sixteen of whom, in our opinion, have returned a morally wrong verdict. The inquest was held at Oldbridge, Middlesex Co., and the substance of the decision is, "that the collision was caused by the gross carelessness of John Anderson, the engineer of the New York train running at an unusual speed by the station and around the curve at Oldbridge. They also found the conductor censurable for omiting to compare his watch with that of the engineer, and the standard clock at the New York station." The Jury exonerated the company from all blame and censure in regard to the said collision. Five of the Jurors refused to sign the verdict, because they thought the company were censurable, and they were right. The evidence went to prove that the accident was caused by a difference of 2½ minutes time in the watches of the engineers and conductors of the two trains. The conductor has the control of running a train, and the engineer is under his orders, and no evidence was presented to prove that the engineer Anderson disobeyed orders. The cause of the accident indirectly was the miserable railroad system which so extensively prevails in our land.—We have been the stern advocates of double tracks, and have frequently called attention to this question. Had this railroad been a double track, would such an accident have occurred? No. Bad must that system of railroad management be, which, as in this case, is the cause of a collision, by a difference of two and a-half minutes in the watches of the different conductors. The State of New Jersey has become infamous by her railroad system, at once the most contemptible and mean in our land, fit only for Fejee Legislators, and Dahomy exactors.

Many new inventions have been brought before the public within the past five years, for the preventing of railroad accidents. No new invention is required to prevent ninety-nine out of every hundred railroad accidents. Double tracks fenced in, no crossings, well laid rails, good bridges, and plenty of steady active guards on the lines, with competent engineers and conductors, will do all that we have asserted for the prevention of accidents. Many of our railroad companies are "penny wise and pound foolish;" by a short sighted economy, "they leap over bundles to gather straws." A single collision by the smashing of two locomotives, will cost about $20,000—a dead loss—and perhaps five times this amount for the payment of damages to the relatives of the killed and injured. Such accidents as those mentioned we expect, will take place until our railroad system is reformed. The people can do this by legislation, and until they do it, we will hold them culpable.

In connection with the above cases, another melancholy collision took place on the Providence and Worcester Railroad, on the morning of the 12th inst, by which 12 persons were killed, and 25 more or less injured. An excursion train out of time, was met by a regular train, running at a rapid rate, and both trains were dashed together and interlocked. This accident could not have taken place on a double track. Our railroad system is bad, and many of the lines are mismanaged with the most glaring recklessness mixed with gross stupidity. Our people should awake to a true sense of their duty; the remedy for railroad accidents is merely a performance of duty.

Pratt's Steam Boiler Explosion.

Messrs. Editors—On page 368 of the Scientific American (three weeks ago) the decision of the jury in the case of Thomas Reily was published, which decision you characterized as an "outrageous" one—not creditable to coroner or jury. At that time I had read the account of the investigation in the daily papers, and thought you were rather severe in language and not correct in opinion. Since then, Thomas Service, the engineer, has died from injuries he received by the explosion, and having again read over the proceedings of the coroner's investigation in the Reily case, my opinions have undergone a change, and I now believe you were right. With that faculty of detecting error which justly characterizes the Scientific American, your remarks were not too severe—the decision was an "outrageous" one. R. M.

Aug. 11th, 1853. A Mechanic.

[Only that our attention has been painfully directed to this case again, by the death of another victim, we would not have added a brief word to the *brief* remarks referred to by our correspondent.

Murder has stalked and now stalks through our city and land so brazen-faced, in the form of steam boiler explosions, and we have so often in vain directed the attention of lawful authorities, and "the people," to such cases, that we almost consider it labor lost to say a single word when a new case is presented before us; indeed, were it not a matter of duty with us, we would not do it; but, as it is a matter of conscience, we will do our duty "whether men will hear or forbear." The case referred to was one of a very aggravating and melancholy character. A poor man, Thomas Reily, when within but a short distance of his own door in Ridge street, while quietly walking home, smoking his pipe, in the broad blaze of the noon-tide sun, was suddenly struck down upon the pavement by a piece of metal from a boiler which had exploded in another street (Attorney) in Pratt's foundry; his skull was fractured, and in two days afterwards he died in the Hospital. His wife was standing at the door, and saw him coming home; she turned her back to enter, then heard the explosion, looked out, and beheld her poor husband lying insensible on the pavement. The Coroner's Jury, in investigating the cause of his death, hastily decided that some man in Canada was the cause of it,—who the man was they did not know; the Coroner charged them to this effect and so they decided. The direct cause of the explosion was an over-pressure of steam in a miserable boiler, and the man in Canada, as alleged, who built it, had no more to do with the explosion than the shade of Peter Stuyvesant. The owner of the boiler, J. R. Pratt, testified that he bought the boiler for $400, and that its first cost was $1,600; had been made in Canada and had been used seven months; it was a locomotive boiler. We have no strictures to make on buying it for such a low price—a man has a right to buy as cheap as he can, but at the same time the boiler was not a good one, as it had to be braced afterwards, and was defective in strength for the pressure it had to carry. Now the maker of a boiler is not to be held responsible for making a cheap boiler, if he only warrants it to carry a low pressure. Is the maker of a tea-kettle to be held responsible for not making it strong enough, if it bursts to pieces and scalds five or six persons, because its lid was tied down by the person who was using it? Surely not. We therefore believe that the maker of Pratt's boiler, this Mr. Nobody, was not the least to blame for its explosion, but those who were using it. Mr. Pratt bought it cheap, and assumed all the responsibilities of using it, for the safety or danger of those around it.

At the present moment there are hundreds of these powder magazine boilers in our city, to the great danger of the lives of our citizens. There should be boiler inspectors to examine and watch the condition and workings of steam boilers in every city, so as to check unscrupulous men from carrying dangerous high pressure steam in inefficient boilers. Of one thing we are sure, however, if a hundred boiler explosions were to take place in a single day in our city, and a thousand lives sacrificed, nobody would be to blame, if all the Coroner's juries were composed of the same materials, and were guided by the same principles, as the jury in the case of the death of Thomas Reily, by the explosion of "Pratt's Boiler."

Events of the Week.

France on the Scientific American.—Speaking of the Scientific American the Paris "Invention" says:—

"The excellent illustrated journal of Messrs. Munn & Co., is a vast panorama, exhibiting the wonders of the civilization and industry of North America. We take pleasure in introducing this publication to any who may desire to examine it or to subscribe for it."

[We feel obliged for this polite introduction to the French people. We do intend truly to exhibit the "wonders" of American industrial progress, and they will be shown conspicuously in the fore ground of our panorama. But it is also our ambition faithfully to represent all the most notable events of European industry; indeed, we desire to make our paper merit the title of the panorama of the world's industry.

Ocean Telegraph.—One of our city dailies in speaking of the proposed ocean telegraph says:—

"The telegraph, now, is not always reliable, but if it comes to telling real fish stories, will not its usefulness be diminished or destroyed? Besides, some fish—like eels, for instance—are said to be charged with electricity. Who knows but they will monopolize the use of the wire? Perhaps some of our so-called scientific journals which claim to possess all the knowledge extant on every subject, will inform us. At all events, they can tell us whether the telegraphic news will be fresh after having passed through so much salt water."

A so-called scientific journal can answer the last question, and can assure the editor that the *news* will be perfectly fresh when it arrives, as it will not pass through the *salt* water. The first question being a fishy one, can be answered best by the paper that asked it; its pretence to all knowledge on every subject is boundless. We cannot conceive, however, how it ever entered into the head of the interrogator to ask such a question, for *eels charged* with electricity are surely beyond the power of monopolizing any more of it.

A Favored Editor.—A number of the merchants of Glasgow, Scotland, recently presented the editor (Robert Gunn) of the "North British Daily Mail," with a purse containing £390 ($1,950) in testimony of their appreciation of his ability and enterprize as a journalist.

The San Jacinto.

By the "Washington Star" we learn that this war frigate is to get in new machinery when she arrives. Well this is too bad; our naval steamers, with a very few exceptions, are a disgrace to our country.

The cotton crop in Alabama and Mississippi, as we learn by our southern cotemporaries, will be an early and large one.

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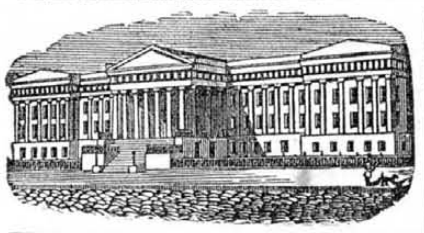

Reported officially for the Scientific American.

LIST OF PATENT CLAIMS

Issued from the United States Patent Office

FOR THE WEEK ENDING AUG. 9, 1853

WINNOWERS OF GRAIN—By Samuel Canby, of Ellicott's Mills, Md.: I claim the construction of the receiving and discharging passages for the grain; that is, the passage at the door, passage, I and passage, J, inthe manner set forth.

MULTIPLYING GEARING—By Frank Dibben & Lewis Bollman, of New York City: We claim the employment in any manner as described, for the purpose of transmitting rotary motion at a multiplied or decreased speed of two pairs of toothed or friction wheels, combined as described, to wit, the said wheels being placed upon two axes, one of which is capable of revolving round the other, one wheel of each pair being on one axis, and the other wheel of each pair being placed upon another axis, as set forth.

[This is a very ingenious invention, and we hope soon to present an engraving of it. See notice on page 236, Vol. 7, Sci. Am.]

LIFE BOATS—By Daniel Dodge, of New York City, and Phineas Burgess, of East Boston, Mass: We do not claim a boat having an opening extending completely through it, whereby it is rendered, by the addition of a floor, fit for service in opposite positions on the water.

But we claim the central fixed platform, which is secured in the opening of the boat in a plane passing centrally and horizontally, or nearly so, through the same, or which may be said to form a partition between two opposite recesses, as described, the said platform serving as a floor to the boat, whichever side is upwards, and being, from its fixed position, incapable of becoming disarranged by any accident

[See engraving of this useful improvement in No. 16, this volume.]

SETTING UP TEN PINS AND RETURNING BALLS—By G. W. Eitchell, of New York City: I claim setting up the pins of an alley by an apparatus operated from the head of the table or elsewhere, by means of a weight or weights attached to them by codds when combined with the elevation board which raises and sustains the weight or weights to admit of the pins being knocked down, as described.

I also claim the use at the back end of the table of a delivery board applied and constructed as described, in combination with an elevator for the elevation and return of the balls, as described.

CARPENTER'S CLAMPS—By B. H. Green, of Princeton, N. J.: I claim the combination of the adjustable vibratory arms and reversible jaws, with the adjustable clamp, for the purpose of presenting jaws of different sizes and at different distances from each other, as set forth.

MODE OF DRYING PAPER—By John Hartin, of New York City: I claim drying paper by passing it between opposite series of equal sized fans, which revolve with equal velocities; by which a pressure of air of equal force is made to act simultaneously upon opposite sides of the paper, and thereby insure smooth and uniform surfaces upon the same, as set forth.

RAILROAD CAR SEATS—By Samuel Hickok, of Buffalo, N. Y.: I claim constructing a railroad car seat by connecting and arranging the sliding seat with the revertible back hinged at the extremity of the reversing arms, and combining therewith the double ratchet bars, in such a manner that it can be easily converted in either direction into a day or night seat, and at the same time not occupy more space than the ordinary stationary seat, as set forth.

I also claim the triangular foot rest in combination with the sliding seat, whereby it is made adaptable to the seat when used either as a day or night seat, as set forth.

WINNOWERS—By L. S. Ingraham, of Cuyahoga Falls, Ohio: I claim the stair or fluted screen, constructed as set forth.

IRON POSTS FOR FENCES—By J. W. Jenkins, of Greenport, N. Y.. I claim the arrow-headed or barbed bottom of the post, in combination with the twisted cross-piece, as set forth.

FIRE ARMS—By George Leonard; of Shrewsbury, Mass.: I claim a revolving fire guide, which, by the continued operation of the fire arm, shall successively communicate fire to the different charges of several barrels.

PRINTING PRESSES—By John Lewis, of Buffalo, N. Y.: I claim the swinging bail and the pressure bail, constructed as set forth.

CORN SHELLERS—By E. L. Millis, of Rochester Depot, Ohio: I claim reducing the larger ears of corn to be shelled to a nearly uniform size with the smaller ones, by passing the whole through between a toothed cylinder and concave, where the large ears are caught and partially reduced or operated upon preparatory to their passing with the smaller ones through between a second cylinder and concave, when the entire operation of shelling and separating takes place, as described.

PRINTING PRESSES—By Joel G. Northrop, of Syracuse, N. Y.: I claim the combination of the series of intermittingly rotating platens with a vibrating bed, when so arranged as that the delivery of the priated sheet is from the lower of the series of platens, so that it may drop from the platen on to the paper table, or into a drawer, as described.

FRICTION ROLLERS.—By James Patterson, of Franklinville, N. Y. I claim fitting the bearing of a rolling car wheel on a fixed axle, with a series of friction rollers having bearing of large diameter to run in contact with the wheels, and of smaller diameter to run in contact with the axle, the latter being enlarged at the point of contact with the rollers, as specified.

ROLLING RAILROAD AND OTHER IRON—By A. B. Seymour, of Hudson, N. Y.: I do not wish to limit myself to the modes of application specified; nor do I claim the employment of a series of draw rollers to act in succession on a bar of iron or other metal to draw it into a required form.

But the employment of a series of pairs of rollers, so arranged that the pairs in the series shall be free to move from or towards each other to adapt themselves to the condition of the metal in the process of rolling, as specified.

REPEATING FIRE ARMS—By Joshua Stevens, of Chicopee, Mass. (assignor to the "Massachusetts Arms Co.): I claim constructing and combining together, as described, the lock, trigger, and mechanism for rotating and locking and unlocking the coambered cylindered, as that while, by a simple pull of the trigger, the operations of enlocking and rotating the magazine or chambered cylinder, relocking it, and discharging the cock, shall be caused to take place by power applied to the trigger alone, the elevation of the cock, or the cocking of it, shall be previously effected by the hand of a person or means entirely separate from the trigger, as described.

I also claim the combination of the stirrup, the spring bolt, and the lever, as specified.

I also claim the combination of the sectoral plate, made as described, with the spring bolt and slot, the said plate being applied and operated essentially as explained.

I also claim the method set forth, of constructing the lever, viz, of two parts (turning on one common pin) in combination with their confining and adjusting screws, as described.

DESIGN.

STATUE OF DANIEL WEBSTER—By Thomas Ball, (assignor to G. W. Nickols), af Boston, Mass.

American Association for the Advancement of Science.

As we have stated in a previous number, this respectable Association, after a two years' recess, met at Cleveland, Ohio, on the 28th of last month, and continued in session for five days, then adjourned after deciding upon the meeting in the city of Washington, D. C., in May next year. We will now present an abstract of the most practical interesting papers, and finish the same with this volume of the Scientific American.

Prof. Pierce, of Cambridge, Mass., President of the Association organized the meeting and delivered a very neat and appropriate address. He said:—

"We are again met in the service of a high cause; after the unusual interval of two years we have again come together at an appointed rendezvous, to make each other glad with the tidings of truth which we bring from the heavens and the earth, and to reanimate our fainting zeal by the story of the successful search for the philosopher's stone, the true elixir vitæ, the fruit of the tree of knowledge, and the footprints of Him to whom the earth is a footstool.

Gentlemen, we are not convened for a light duty. Our self-imposed task is not an amusing child's play, and we have not accepted the liberally offered hospitalities of this beautiful city for the enjoyment of a social festival. We have come to give and to receive instruction and inspiration.

Gentlemen, we have come to study our duty as scientific men, and especially as American scientific men. We are to learn the apparent and not very pleasant paradox that America cannot keep pace with Europe in science, except by going ahead of her. The New World must begin to build upon a level above that of the Old World, and it must build from its own materials. This is not asking too much. It is no more than was accomplished by the American Ship and the American Reaping Machine. The Yankee who picked the hardest lock in England, and contrived a lock which all England could not pick, is but a type of American intellect. This was a work of mind, and we have a right to expect equal excellence in higher and more abstract efforts of American genius.

But above all things it is not to be forgotten that the temple of science, by whomsoever built, belongs to no country or clime. It is the World's Temple, and all men are free of communion. Let us not mar its beauty by writing our names upon its walls. The stone which we have inserted is not ours; it is not thine, it is not mine, but it is part of the temple.

Let us not presume to make these walls resound with the bickerings of angry contention for superior distinction, and the foul complaints of mortified vanity. Let us not raise the money-changers' cry of 'mine and thine,' lest the purifier come, and taking the royal jewel into his own possession, thrust us out into the ditch, and turn our fame into infamy.

It has been observed by others not of our own number, that the meetings of the Association have been characterized by a generous appreciation of each other's labors. But mutual admiration is not our only or our most necessary office. Mutual criticism is equally imperative and equally conducive to the best interests of the Association.

We must not permit erroneous statements to pass unchallenged. It is our stern and solemn duty to criticise and expose all false developments, whether they are intended, or the unintentional results of carelessness or ignorance.

SATURN'S RING.—Prof. Pierce then proceeded to make some remarks on the ring of Saturn, confirmatory of his investigations on this subject, laid before the Association in 1851. The opinion adopted is, that the ring is a fluid. He said he had now the pleasure of confirming the impressions he then held, condemnatory of the theory advanced by La Place. We quote a passage from his remarks at Cincinnati:—

"The author of the '*Mecanique Celeste*' proved that Saturn's Ring, regarded as solid, would not be sustained about the primary, unless it had decided irregularities in its structure. But the observations of Herschel and others have failed to detect any indications of such irregularity, and a laborious series of observations have finally convinced Mr. Bond of the utter impracticability of any important irregularities, and he has, therefore adopted the conclusion that Saturn's Ring is not solid, but fluid. * * * * I am now convinced there is no conceivable form of irregularity, and no combination of irregularities, consistent with an actual ring, which would permit the ring to be permanently maintained by the primary if it were solid. Hence it follows, independently of observation, that Saturn's Ring is not solid."

LITHOGRAPHY.—A paper of which the following is an abstract, was read on this subject by Lieut. E. B. Hunt, U. S. N. This art was discovered by Aloys Senefelder, in 1799, only 54 years ago. By the labors of D'Offenbach, DeLasteyrie, Engelmann, Ackerman, Lemercier, and others, the infant art, in being propagated from Munich, its birth-place, has also been much improved in many of its details, and has had some important extensions of its sphere of usefulness and capacity. DeLasteyrie's autographic printing and Engelmann's printing in colors, were great expansions of Senefelder's invention, while the excellent management of landscape and scenic effects in Ackerman's establishment in London demonstrated a new capacity of the art. Of all artistic inventions none has so eminent a capacity for being abused as Lithography. In thoroughly skillful hands, it has the capacity for producing effects of a high order, and some which are peculiar felicities of this art alone. But that this result may be attained, it is indispensable that labor, care, and skill, and indeed all the elements of any excellent art, should conspire. The artist needs to be such in fact, as well as in name, and the printer must possess appreciation of the subject printed, and a technical mastery of his business, such as is quite too rare, especially among us.

Lithography owes not only its existence but its possibility to the fact that several quarries, in the vicinity of Munich, furnish slabs of a limestone unform in texture, apparently compact, yet really having a somewhat open grain. Though other localities furnish stones which could be used, the real commerce of lithographic slabs is limited to the Bavarian quarries, especially Poppenheim and Sonnhofel. These furnish stones of ordinary sizes, quite cheaply, so that those new quarries, which are from time to time announced, must encounter a slow market at the start, unless they are able to furnish, in all the requisite perfection, the largest sizes used. The qualities of a good stone are homogeneousness, with freedom from veins, specks, and flaws, a yellowish white, or a pearly-gray color which is uniform, a hard, fine, uniform grain, a conchoidal fracture with a good degree of strength, and a capacity for receiving good grained or polished surfaces, and of being uniformly acted on by acids.

Autographic printing is not now much used, though cases frequently occur in which it is very convenient or even important. Special attention, in transfer printing, is to be devoted to the quality of the paper used. The paper has a great effect both on the clearness of the printing and the duration of the transfer.—Transfer printing, even as it is now practiced, must be called eminently useful. Senefelder himself used it, though quite imperfectly, of course; but it is only during the past twenty years that its capacities have been really developed. The rapid improvement it has experienced makes it almost certain, that before many years more it will have become quite perfect and certain in its results. It is now very far advanced in France, the home of lithographic art and science, as the maps of departments, printed by the Government, fully establish. The plates of the great topographical survey of the interior of France are rearranged by transfer, into excellent maps of the departments, with special borders and titles, and full letter press statistical notes, printed from movable type, and transferred into the proper spaces. In England and Scotland, plate-transfer printing is prosecuted as a business, though with what success I have not the means of knowing. In this country, the great amount of transfer from stone on to stone, in making up checks, bills, labels, &c., supplies many shops with petty jobs in one species of transfer; but a few only are engaged in transferring large steel or copper plates. To do this well requires a man to make plate-transferring his business, and otherwise, not only will he fail of success, he will be apt to seriously injure or deface plates entrusted to his handling. Our principal establishments in which plate-transfer printing is extensively executed are, J. Ackerman's, No. 379 Broadway, N. Y.; D. McLellans, No. 26 Spring street, N. Y.; Wagner & McGuigan's, Franklin-square, Philadelphia; and Duval's, Philadelphia. The plates of the Coast Survey Report have been in part printed by each of these establishments, though sometimes their work has furnished very poor evidence of any skill in managing this process. It was by being for the last two seasons assigned to the charge of inspecting the work on these plates, executed by the two first-named establishments, that I was led to such an acquaintance with the subject as to induce me to make this communication.

(To be Continued.)

Remarkable Discovery in Russia.

M. B. Larsky, the engineer, lately deceased, who had also acquired a reputation as a poet and an archæologist, made a discovery of the greatest importance in White Russia—a discovery brought to light when his papers were examined after his decease. Being occupied in making a road in that province he found it necessary to drain off the waters of a lake into another lake at a lower level, and in the course of the operation he discovered in a forest, several feet below the surface of the soil, a road paved in the antique Roman or Mexican style, with traces of a stone bridge of a peculiar construction. In M. Larsky's opinion 2000 or 3000 years must have elapsed before the face of the country could have been transformed to such an extent as he observed, and if this supposition be well founded this district must have been inhabited before the time of the Scythians by a more civilized nation. M. Larsky's discovery will, doubtless, not pass unnoticed, and may lead to important results.

New Sculling Propoller.

A small boat has recently been constructed at Richmond, Va., which is propelled by a propeller, called the "submerged or scull propeller." The power is applied to the stern of the boat, and operates in the manner of a fish tail waving from side to side, to give the impetus. On each side of the boat there is an upright lever, between which the operator sits, and by working the levers backwards and forwards, the motion is given to the fish-tail and to the boat. The boat is about nine feet long and three wide, and the speed, with one man in it, about four miles an hour.

Potato Rot.

Accounts from various places inform us that the potato rot is very prevalent this year.—We are glad that the wheat crop will make up the deficiency. During the past two years potatoes have been too dear for poor people to purchase.

The city of New Orleans is severely afflicted with yellow fever this summer; no less than 200 have died in one day. The cholera was not half so deadly.

Great fires have recently been raging in the woods of New Brunswick, and Prince Edwards' Island, provinces.

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TO CORRESPONDENTS.

W. B., of Pa.—You express yourself somewhat surprised to see Mr. Mills scheme published in the Scientific American. It may or may not be practicable—we did not decide upon this point—we presented the subject as one of novelty and interest, our readers are not obliged to believe in it, and there is no reason why we should not publish it as we do many other new and untried schemes. Let us have all sides fairly presented. We will decide upon what shall or shall not appear in this paper, and employ our own terms in dealing with all subjects.

V. L. M., of Pa.—On the New York and Philadelphia Railroad, the curtain which you describe is employed on the cars to prevent the rising of the dust from the track. It was suggested by an eminent mechanic living in this city—it works admirably, and we hope to see other roads adopting it.

H. J., of Ind.—We expect soon to publish engravings of Irving's Boiler, then you can readily understand the principal upon which it operates.

H. T. R., of N. H.—Explain what you mean by anchors for stopping railroad trains. The mere idea is not patentable. You must fix your ideas into a tangible contrivance.

A. C. C., of Tenn.—It is impossible for you to make the rails answer the purpose of a covered wire. You cannot properly isolate them. You may be sure of this.

W. T., of Me.—We see nothing new or patentable in the plough, but the fence appears to possess novel features.

R., of Nova Scotia.—Richard Kitson, of Lowell, Mass, can give such information as you desire in regard to oakum.

W. J. T., of N. Y.—We received your letter of June 6th, and replied to it very promptly, the reply missed you it appears. We advise you to send us a model of your measurer

T. B., of Ind.—There is nothing patentable in your method of coupling, we have seen the same thing before used in carriages.

J. A. T., of Miss.—G. Page, of Baltimore, Md., or Geo. Vail, & Co., Morristown, N. J., can furnish you with portable saw mills. The clock work for faning rooms was invented and patentee by Com. Barron, 1830.

A. G., of Ill.—Yours came too late for this number. It was a most unjust act in your case.

E. J. H., of Pa—Mr. R. is now at Niagara Falls, superintending the erection of a new suspension bridge; we have not seen his article but will look for it

M. B., of N. H.—You have never read the history of the steam engine; read it.

L L, of Ohio.—The papers of the scientific association will be published by the city authorities of Cleveland.

H. McN., of Conn.—There is no difference between your principle for heating apartments and heating them by steam pipes connected with a boiler.

J. R. M., of Pa.—We have no faith in the value of your device, and it is not altogether new in substance; a caveat was filed some twelve months since for essentially the same thing.

T. F. W., of England—We do not know of "self-acting gates at railroad crossings," like the one decribed in your letter; there are, however, good gates here for the same purpose, but railway companies do not feel willing to trust them.

Money received on account of Patent Office business for the week ending Saturday, Aug. 13:—

H. L. R., of Mich., $60; J. L. L. M., of Pa., $30; C. W. C., of Mo., $30; G. B., of N. Y., $100; E. M., of Pa., $55; J. C., of N. Y., $30; H S, of Texas, $50; W. E. B., of Ala, $30; J. M., of Ohio, $50, W. McB., of Ohio, $30; J. P. H., of Ohio, $30.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday Aug. 13:—

S. P., of N. Y (2 cases); H. A. C., of Mass.; W. M. & K., of Ill; W. F. M., of N. Y.; A. E. B., of N. Y.

A Chapter of Suggestions, &c.

BACK NUMBERS AND VOLUMES—In reply to many interrogatories as to what back numbers and volumes of the Scientific American can be furnished, we make the following statement:—Of Volumes 1, 2 3 and 4—none. Of Vol. 5, all but six numbers, price, in sheets, $1; bound, $1.75. Of Volume 6, all; price in sheets, $2; bound, $2,75. Of Vol. 7 all; price in sheets, $2; bound, $2,75. Of Vol. 8, all the back numbers subsequent to No. 27, but none previous.

PATENT CLAIMS—Persons desiring the claims of any invention which has been patented within fourteen years, can obtain a copy by addressing a letter to this office—stating the name of the patentee, and enclosing one dollar as fee for copying.

PATENTEES—Remember we are always willing to execute and publish engravings of your inventions, provided they are on interesting subjects, and have never appeared in any other publication. No engravings are inserted in our columns that have appeared in any other journal in this country, and we must be permitted to have the engraving executed to suit our own columns in size and style. Barely the expense of the engraving is charged by us, and the wood-cuts may be claimed by the inventor, and subsequently used to advantage in other journals.

GIVE INTELLIGIBLE DIRECTIONS—We often receive letters with money enclosed, requesting the paper sent for the amount of the enclosure, but no name of State given, and often with the name of the post office also omitted. Persons should be careful to write their names plainly when they address publishers, and to name the post office at which they wish to receive their paper, and the State in which the post office is located.

ADVERTISEMENTS.

Foreign and American Patent Agency

IMPORTANT TO INVENTORS.—The undersigned having for several years been extensively engaged in procuring Letters Patent for new mechanical and chemical inventions, offer their services to inventors upon the most reasonable terms. All business entrusted to their charge is strictly confidential. Private consultations are held with inventors at their office from 9 A. M., until 4 P. M. Inventors, however, need not incur the expense of attending in person, as the preliminaries can all be arranged by letter. Models can be sent with safety by express or any other convenient medium. They should not be over 1 foot square in size, if possible.

Having Agents located in the chief cities of Europe, our facilities for obtaining Foreign Patents are unequalled. This branch of our business receives the especial attention of one of the members of the firm, who is prepared to advise with inventors and manufacturers at all times, relating to Foreign Patents.

MUNN & CO., Scientific American Office,
128 Fulton street, New York.

URE'S DICTIONARY—NEW EDITION—A dictionary of arts, manufactures, and mines—Containing a Clear Exposition of their Principles and Practice, by Andrew Ure, M. D., Illustrated with sixteen hundred engravings on wood. Fourth Edition. Corrected and greatly enlarged. Many of the articles entirely re-written, and many new cuts added. 2 large vols, 8 vo. cloth. D. APPLETON & CO., will shortly issue a new edition of Ure's Dictionary, re-printed entire page for page with the new and greatly enlarged edition just published in England. Although this work is enlarged to two volumes, comprising in all 2116 pages, the price of the new edition will not be increased beyond the price of the former edition—Five Dollars. The trade and the public are invited to send their orders without delay to ensure prompt delivery of this very cheap and popular work. 200 Broadway, N. Y 49 2

WANTED—The address of a mochinist who understands making machinery for manufacturingg an improved gun lock. I shall want a machine for pressing the hammer, for pressing the dog, for forming the end of the main-spring, for punching the slot in the plate, for making and heading the different sized screws required; a drilling machine, and all the necessary machinery for grinding and polishing the different parts of the lock; engraving the plate, and, in fact, every thing necessary for the rapid and economical production of said locks, except the motive power. Address WM. HENRY, Jr., Wooster, Ohio. 49 3*

ATKINS' SELF-RAKING REAPER—The unequalled success of this machine, both in grain and grass, and the information already received from agents, shows the demand another season will be more than I can supply. Every reaper heard from (about 30 in seven different States and Canada) gives good satisfaction with no drawbacks, though others yet to hear from may be. The inventor (Mr. Atkins) would like to realize something from the patent at once, and part of the States may be offered for sale If a satisfactory price cannot be got, then arrangements may possibly be made with manufacturers to build and pay a patent fee. A machine can be seen at the Crystal Palace, and others will be at some of the State and County Fairs this Autumn. J. S. WRIGHT.

"Prairie Farmer" Warehouse, Chicago, Ill, Aug. 6th, 1853. 49 5*

IRON FOUNDRY FOR SALE.—In full operation, twelve moulders employed, and a good run of custom and job work, in a village near New York; alwoys accessible. Address "J. F." box 1209, New York Post Office. 49 2*

UNITED STATES PATENT OFFICE,
Washington, July 28, 1853.

ON THE PETITION OF JOHN H TIMS, of Newark, N. J., praying for the extension of a patent granted to him on the 31st day of October, 1839; for an improvement in bearings and oil boxes for railroad cars, &c., for seven years from the expiration of said patent, which takes place on the 31st day of October, 1853.

It is ordered that the said petition be heard at the Patent Office on Monday, the 3rd of October next, at 12 o'clock, M.; and all persons are notified to appear and show cause, if any they have, why said petition ought not to be granted.

Persons opposing the extension are required to file in the Patent Office their objections, specially set forth in writing, at least twenty days before the day of hearing; all testimony filed by either party to be used at the said hearing, must be taken and transmitted in accordance with the rules of the office, which will be furnished on application.

Ordered, also, that this notice be published in the Union, Intelligencer, and Evening Star, Washington, D. C.; Pennsylvanian, Philadelphia, Pa.; Evening Post, New York; Boston Post, Boston, Mass., and Inquirer, Cincinnati, Ohio, once a week for three successive weeks previous to the third day of October next, the day of hearing. CHARLES MASON,
Commissioner of Patents.

P. S.—Editors of the above papers will please copy and send their bills to the Patent Office, with a paper containing this notice. 48 3

AMERICAN PIG IRON—Of the brands Wm. Penn, Swede, Amenia, Durham, Allentown, Sterling, Crane, and Mount Hope—also Scotch Pig Iron of favorite brands constantly on hand and for sale by G. O. ROBERTSON, 135 Water street, cor. of Pine. 43 8*

FURNACE AND MACHINE SHOP FOR SALE—A first class Furnace and Machine Shop, with or without stock on hand; has done a business of about $15,000 per year for the last two years, which can be increased; situated in one of the best business towns in Central New York, on a railroad and canal. The owner having been in the business more than twenty years, wishes to withdraw from it. Terms liberal. For further particulars apply to JAMES FREELAND, Esq., of the firm of Freeland, Stuart & Co., 21 Park Row, New York City. 48 4

HELVETIA AND LAFAYETTE GOLD MINING Company, located at Grass Valley, California, (organized July 7, 1852), is now in the full tide of successful operation; its veins are opened, being worked, and highly productive: its mill is of great power, complete in all respects, and now working with the most satisfactory results, and its prospects for future success, founded upon actual experience, are of an unusually flattering nature. There was taken out previous to Dec. 20, 1852, upwards of $169,000, and the yield of the mine is steadily increasing with each successive report. Dividends payable quarterly in October, January, April, and July, at the office of the Company, in Grass Valley, and at the Agency Office in New York A few shares and copies of the charter and by-laws, together with further particulars, may be obtained upon application to DANIEL ADEE, Agent,
48 3* No. 107 Fulton st, New York.

LAWRENCE SCIENTIFIC SCHOOL, Harvard University, Cambridge, Mass. The next term of this institution will open on the first day of Sept., 1853, and continue 20 weeks. Instruction by recitations, lectures and practical exercises, according to the nature of the study, will be given in Astronomy, by Messrs. Bond; Botany, by Prof. Gray; Chemistry, Analytical and Practical, by Prof. Horsford; Comparative Anatomy and Physiology, by Prof Wyman, Engineering, by Prof. Eustis; Mathematics, by Prof Pierce; Mineralogy, by Prof. Cooke; Physics, by Prof. Lovering; Zoology and Geology, by Prof. Agassiz. For further information concerning he School, application may be made to Prof. E. N. Horsford, Dean of the Faculty.
Cambridge, Mass., July 15, 1853. 44 8*

PALMER'S PATENT LEG—Manufactured by Palmer & Co., at No. 5 Burt's Block, Springfield, Mass., for New England and New York State, and 376 Chesnut st, Philadelphia; in every instance of competition in the Fairs of the various Institutes of this country, has received the highest awards as "the best" in mechanism, usefulness, and economy. At the "World's Fair," London, 1851, in competition with thirty other varieties of artificial legs (by the best artists in London and Paris,) it received the Prize Medal as the best. 47 10*

EUROPEAN PATENTS—MESSRS MUNN & Co. pay special attention to the procuring of Patents in foreign countries, and are prepared to secure patents in all nations where Patent Laws exist. We have our own special agents in the chief European cities, this enables us to communicate directly with Patent Departments, and to save much time and expense to applicants.

FOUNDRY FOR SALE—In the village of Westerly, R. I.; location unsurpassed. Sales of castings, for the past 6 months over $14.000. Apply soon (post paid) to C. POTTER, Jr., Agent, Westerly, R.I. 47 4*

COTTON MACHINERY—For sale, very low, viz. 1-30 inch batt card, 1 warper, 2 dresser fans, and 1 iron boiler. Apply to E. WHITNEY, New Haven, Ct. 45 6

NORRIS WORKS, Norristown, Pa. The subscribers build and send to any part of the United States, Pumping, Hoisting, Stamping, and Portable Engines, and Mining Machinery of every description. THOMAS, CORSON & WEST. 40 1y.

NORCROSS ROTARY PLANING MACHINE,—Decided by the Circuit Court not to infringe the Woodworth Machine—I now offer my Planing Machines at a low price; they are not surpassed by any machines as to amount or quality of work. Tongueing, &c. Address me at Lowell, Mass.,
39 20* N. G. NORCROSS.

ANDREWS & JESSUP—No. 70. Pine street New York, Commission Merchants for the sale of all kinds of Cotton and Woolen Machinery, Machinists' Tools, Belling, &c. Importers and dealers in every variety of manufacturers' articles. 43tf

ENGINEERING—The undersigned is prepared to furnish specifications, estimates, plans in general or detail of steamships, steamboats, propellers, high and low pressure engines, boilers, and machinery of every description. Broker in steam vessels, machinery, boilers, &c. General Agent for Ashcroft's Steam and Vacuum Gauges, Allen & Noyes' Metallic Self-adjusting Conical Packing, Faber's Water Gauge, Sewall's Salinometers, Dudgeon's Hydraulic Lifting Press, Roebling's Patent Wire Rope for hoisting and steering purposes, etc. etc.
CHARLES W. COPELAND,
29 26* Consulting Engineer, 64 Broadway.

PATENT LAWS OF THE UNITED STATES, and information to inventors and patentees; for sale at the Scientific American office. Price 12 1-2 cents.

WHEELER, WILSON, & Co.—Watertown, Ct., proprietors and manufacturers of Allen B. Wilson's Patent Stitching Machine. Patented June 15, 1852, it can be seen at the Company's Office, 265 Broadway, New York. 30 20*

ATMOSPHERIC TELEGRAPH—The English patent (just issued) is now offered for sale at the Company's office, 24 Merchant's Exchange, Boston, Mass. I. S. RICHARDSON,
35tf Agent A. T. Company.

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McALLISTER & BROTHER—Opticians and dealers in mathematical instruments, 48 Chesnut st, Philadelphia Pa. Mathematical instruments separate and in cases, Protractors, Spacing Dividers, Drawing Pens, Ivory Scales, Tape Measures, Salometers, Spy Glasses, Microscopes, Hydrometers, &c. &c. An illustrated and priced catalogue will be sent by mail free of charge. 39 6m*

A GOOD CHANCE FOR MANUFACTURING—A Water Privilege of ten feet fall, on a never-failing stream, with four acres of choice land, in the town of Cornwall, Orange Co., N. Y., 5 miles from the North River, and three miles from the railroad depot, and on the line of survey of the Albany and Hoboken RR. For particulars inquire of John J. Vanduzer, 184 Canal st, N. Y., or John Orr, on the premises. 40 13*

NEW METHOD FOR MAKING WROUGHT- Iron direct from the Ore—The proprietors of James Renton's Patent, who have purchased Alex. Dickerson's patent for the above purpose, are desirous of introducing the invention into general use, and invite parties who may wish to negotiate for rights for States and counties, or for furnaces, to make immediate application, and to examine the furnace which is in successful operation at the American Iron Company's Works, Newark, N. J. The invention is exciting considerable interest; gentlemen from all parts of the country, who are engaged in the manufacture of iron, have examined the furnace in its workings, and give it their decided commendation. A circular, giving more minute information, will be sent to those desiring it. The rights for several States and counties have already been disposed of. Applications for rights in the State of New Jersey may address the Hon. J. M. Quinby, President of the American Iron Company. Inquiries or applications for other States may be made to A. H. BROWN, Newark, N. J, Office 107 Market st. 34tf

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15tf

THE NEW HAVEN MANUFACTURING Company, New Haven, Conn., having purchased the entire right of E. Harrison's Flour and Grain Mill, for the United States and Territories, for the term of five years, are now prepared to furnish said mills at short notice. These mills are unequalled by any other mill in use, and will grind from 20 to 30 bushels per hour of fine meal, and will run 24 hours per day, without heating, as the mills are self-cooling. They weigh from 1400 to 1500 lbs., of the best French burr stone, 30 inches in diameter: snugly packed in a cast-iron frame, price of mill $200, packing $5. Terms cash. Further particulars can be had by addressing as above, post-paid, or to S. C. Hills agent N. H. M. Co., 12 Platt st, N. Y. 28tf

MACHINERY.—S. C. HILLS, No. 12 Platt-st. N Y. dealer in Steam Engines, Boilers, Iron Planers, Lathes, Universal Chucks, Drills; Kase's, Von Schmidt's and other Pumps; Johnson's Shingle Machines; Woodworth's, Daniel's and Law's Planing machines; Dick's Presses, Punches and Shears; Morticing and Tennoning machines; Belting; machinery oil, Beal's patent Cob and Corn mills; Burr mill and Grindstones; Lead and Iron Pipe &c. Letters to be noticed must be post-paid. 40tf

A. B. ELY, Counsellor at Law, 52 Washington st., Boston, will give particular attention to Patent Cases. Refers to Munn & Co., Scientific American. 16tf

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E. A. BOURRY & H. E. ROEDER—Consulting and Mechanical Engineers; Office No. 333 Broadway, New York City. 43 9*

C. B. HUTCHINSON'S PATENT STAVE Cutting Machines, the best in use, and applicable alike to thick or thin staves; also his Head Cutting and Turning, and Stave Jointing Machines.
For machines or territorial rights, apply to C B. HUTCHINSON & CO., Syracuse, N. Y. 36tf

J. D. WHITE'S PATENT CAR AXLE LATHES —also Patent Engine Screw Lathes, for boring and turning tapers, cutting screws, &c. We manufacture and keep constantly on hand the above lathes; also double slide Chuck and common Hand Lathes, Iron Planers, S. Ingersol's Patent Universal Ratchet Drill, &c. Weight of Axle Lathe, 5,500 lbs; price $600; Engine Screw Lathe, 1400 to 7,000 lbs; price $225 to $675, BROWN & WHITE,
27tf Windsor Locks, Conn.

CIRCULAR SAW MILLS—The undersigned are manufacturing, and keep constantly on hand, "Child'z Premium Double and Single Circular Sawing Machines" The best machines in use for sawing lumber from logs of all sizes, and warranted capable of cutting more lumber in a given time than any other mill. Shafting, gearing, and all other mill work, made to order, with dispatch and in a workmanlike manner. H. WELLS & Co
Florence, Hampshire Co., Mass. 44 6*

THE NEW HAVEN MANUFACTURING CO. No. 2 Howard st, New Haven, Ct., are now finishing 6 large Lathes, for turning driving wheels, and all kinds of large work; these lathes weigh 9 tons, and swing 7 1-3 feet, shears about 16 feet long. Cuts and further particulars can be had by addressing as above, post-paid, or to S. C. Hills, agent N. H. M. Co., 12 Platt st, N. Y. 28tf.

LEE & LEAVITT—Manufacturers of every scription of Cast Steel Saws, No. 53 Water street, between Walnut and Vine, Cincinnati, O. 27 6m*

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SCIENTIFIC MUSEUM.

Remedy for Yellow Fever.

We have seen it stated in a number of our exchanges that a remedy for yellow fever has been discovered at Angostura, Venezuela.—The remedy is the plant vervain or verbena, which grows abundantly in that region.—The expressed juice of the leaves given in small doses three times a day, with an *enema* of the same every two hours, is stated to be a perfect cure for the yellow fever and black vomit, even in their most threatening stages. All the physicians of Angostura have adopted this treatment of the disease, and they state that hardly any deaths occur under its influence. This information is furnished by Mr. Mathison, the British Vice-Consul at the above place.

The varieties of the verbena growing in the warm and temperate regions of the Western world are numerous. The particular species referred to above, is that known to botanists by the name of "verbena jamaicensis." It is a native of the West India Islands, as well as of the continent. There are two kinds of it, the male and the female; the latter is the one used as above. It has long been known to the creole population of Spanish America for its medicinal virtues. They have used it as a febrifuge and an unfailing specific in cases of dysentery. It is generally given to children as a tea, mixed with sugar and milk, and is by no means a disagreeable beverage. The expressed juice of the plant forms a cooling purge for children in fevers. The vervain is likewise a remedy of particular note in sundry maladies that defy ordinary medicines. Sloane says it is a powerful deobstruent; according to Barham, it is likewise an excellent vermifuge. And, having now been discovered as a cure for yellow fever, the shrub must in future rank as a still more valuable addition to the pharmacopœia.

Materials for Milk Pans.

According to the experiments of M. Hinueber, of Moisburg, Germany, one hundred Hanover quarts of milk yielded, in tinned milk-pans, 7·07 Hanover lbs. of butter; Glass, 7·04 Wooden (not painted), 6·96; Earthenware, 6·92; Wooden (painted), 6·67. According to the same experiments, there required for one of milk; produced by stall-feeding with tare and clover, 15·67 quarts; by pasturing, 11·84 showing that the milk obtained from cattle fed upon pastures is richer in butter than milk got from cows which have been fed in the stable with one and the same kind of plants: even a mixture of tare and clover shows an increase over clover alone.—[Polytec. Jour.

[By the above, tinned milk pans are the best for cooling milk and obtaining cream. In some dairies, however, all the milk is churned, and we should suppose that this was the best way to obtain all the butter in the milk. There is no butter in the tin, therefore, we suspect, that one vessel is just as good as another, if clean, in which to churn the milk.

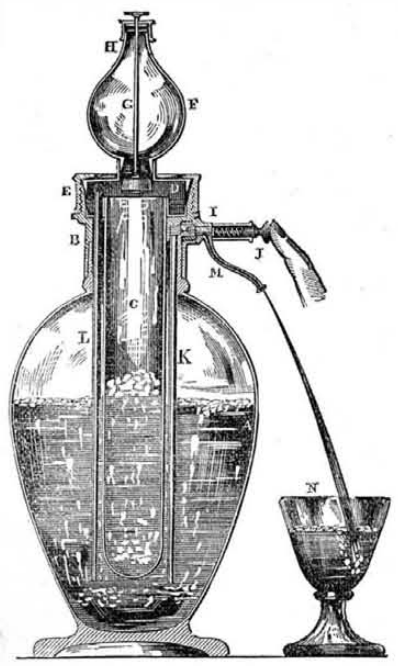
Bed Clothes.

The perfection of dress, for day or night, where warmth is the purpose, is that which confines around the body sufficient of its own warmth, while it allows escape to the exhalations of the skin. Where the body is allowed to bathe protractedly in its own vapors we must expect an unhealthy effect upon the skin. Where there is too little ventilating escape, insensible perspiration is checked, and something analogous to fever supervenes. Foul tongue, ill taste, and lack of morning appetite betray the evil.

Percussion Caps Superseded.

A new composition has lately been invented by Messrs. Winiwarter and Gersheim, of Vienna, for the purpose of superseding the ordinary percussion caps, and, in many instances, the gunpowder charge also. The most prominent feature of these gun primers, as the composition is called, are the absence of a metallic coat or cover, and their uniform explosive power, the materials being of such a nature that, after a detonation, no residue whatever is left behind. The materials which form the new composition are fulminating mercury, chlorate of potash, and sulphide of antimony, the dangerous properties of which ingredients are diminished by the application of collodion, which is used as a cement, and it is the ingenious employment of this substance which constitutes the chief peculiarity of the invention.

Aerated Water Apparatus.



This is an aerated water apparatus, introduced by Messrs. Gaillard & Dubois, of Paris. The main features of this arrangement consist in the employment of three distinct chambers, or receptacles, one being for the water to be aerated, a second to contain the effervescing powders, and a third to retain a small quantity of pure water, which, after the apparatus is closed, is allowed to fall upon the powders, thereby causing the evolution of the carbonic acid gas. This figure represents one modification of this ingenious apparatus. The water, or other liquid to be aerated, is contained in a glass bottle, A, of elegant shape, and formed with a wide cylindrical neck, to which a metal collar piece, B, is cemented. This collar is bored out to receive the long cylindrical vessel, C, like a chemical test tube in shape, supported by a metal ring into a recess in the collar, B. Above the collar, B, is bored out conically, to receive a conical lid, D, which is screwed down by the cap-piece, E, the joint being rendered hermetic by the introduction of a ring of leather or caoutchouc, between the conical surfaces. The lid, D, has a central opening, into which is cemented the small glass vessel, F, resembling a hollow stopper from its shape and position. It is fitted with a conical plug, the spindle, G, of which passes through a small stuffing box at the top, and has a button attached outside. The stuffing employed is a disc or washer of leather or caoutchouc, which is compressed by the screw-cap, H. Into one side of the collar, B, is screwed a species of siphon cock, I, consisting of a plug valve, opened by the pressure of the finger on the external button, J, and closed by the action of a helical spring. The passage of this valve communicates with a tube, K, of small bore, reaching nearly to the bottom of the vessel, A. On the opposite side is another similar tube, L, descending to a like depth, and terminating above in a small rose, and in communication with the vessel, C, in which the gas is evolved. The manner of proceeding in using this apparatus is as follows:—The cap, E, is unscrewed, and the three vessels are separated, when the largest, A, is filled to nearly seven-eighths of its capacity with the liquid to be aerated. The bicarbonate of soda and tartaric acid, or other powders for producing the gas, are now put into the tubular vessel, C, which is then put into its place in the vessel, A. The vessel, G, is next filled with pure water, and the plug being tightly closed, it is placed in position, and the whole screwed together again. When it is wished to set the matters in action, the plug spindle G, is depressed, and the water descends upon, the effervescing powders, and the gas evolved in consequence finds its way by the tube, L, to the water below, impregnating it and passing through it, so as to exert a pressure on its surface, which, when the cock, I, is open, forces it up through the tube, K, and out by the spout, M, into the glass, N, placed to receive it.

New Way of Checking Railway Baggage.

The following method of checking baggage has recently been adopted with great satisfaction on two or three of the English railways:

When a train, say a down train, arrives at any particular station, a porter attends with a book. It contains tickets of stiff card board bound in the book. Each ticket is about three inches long and one inch wide. It is partly cut. So that two separate parts of it can be easily torn off. The tickets are numbered differently, but each of the three parts of a ticket has the same number. The outer part of the ticket has a loop of tape gummed to it. Suppose a person arrives at a station and is not going on by a train for an hour or two, or a day, and is desirous of leaving a carpet-bag or a trunk at the station. He pays one penny, and in a moment the taped portion of a platform ticket is fastened to the handle of the carpet-bag. This portion bears, as has been already stated, a printed number also; the words "deposited at Winchester," or whatever the station may be, and likewise the words, "for down train." Another portion of the ticket, with the same number as the last, is torn off and given to the owner of the carpet-bag, to be presented at the station when the article is wanted. The words "for down train is omitted on this portion. The portion of the ticket that is left in the book corresponds with that given to the passenger, and is a check on the money-taker. The company then becomes responsible for the safety of the property. Luggage is divided into three classes—that for down train, up train, and to be left till called for, and should be sorted into three different compartments at the station.—For each division there is a separate book of tickets. If a person were to find or steal a ticket, and apply for property, he would be instantly detected, because he would first have to say whether the luggage was for up or down train, or to be left till called for which he could not do unless he owned it.—There is no necessity for any address to be on the luggage. One penny per package per diem is charged for a platform ticket.

A bill is now before the British Parliament, for regulating the hours of factory labor, by preventing the running of machinery after certain hours. The hours of factory labor in England are much shorter than those in our country. Children under ten years are not allowed to labor, and those under 13 years are provided with educational means by their employers. The operatives in these factories are not so well paid as those in America, but their hours of labor are less by 12 per week.

Hot Weather.

On Friday last week the heat was so great in our city, that no less than 50 persons were sun struck. During the week we understand that about 200 persons lost their lives with the heat; they were nearly all foreigners, and mostly natives of Ireland. For thirty years no such excessively hot weather has visited our city. No less than 100 deaths by heat occurred last Sunday.

LITERARY NOTICES.

THE ENGINEER AND MACHINIST'S DRAWING BOOK—Blackie & Son, 101 Fulton street, New York City. This work claims to combine the excellencies of the best French treatises upon mechanical drawing; it is not, however, a translation. The Drawing Book is based mainly upon the work of M. Le Blanc, whose method and illustrations are followed; but the English editor has incorporated the useful matter of other standard treatises, and also added much original matter. The work is systematic and progressive; it commences with a description of drawing instruments and materials, and a preparatory series of exercises, which make the student familiar with the principles of geometry required. In proper order all the difficulties and mysteries of Mechanical Drawing are to be elucidated. Plain and practical instructions are given for representing the most complicated machinery. The illustrations on wood and steel are numerous and beautiful. We find nothing about the work to blame. It promises to become the best book upon the subject. To be completed in 14 parts; Nos. 1, 2, 3, and 4 are issued Pric 50 cents each.

BIBLICAL REPERTORY AND PRINCETON REVIEW—This able Theological Quarterly, for July, published at 265 Chesnut street, Philadelphia, but edited by Dr. Charles Hodge, D. D., of Princeton, N. J., contains four leading articles on different subjects of religious interest, and a fifth contains the proceedings of the late General Assembly of the Old School Presbyterian denomination, which was held at Philadelphia. These proceedings are of great interest.

THE NEW ENGLANDER—F. W. Northrop, New Haven, Ct.—The August number of this well known magazine and review is worthy of its high reputation. The articles are chiefly on matters of interest at the present time; we would commend to notice, particularly, the article on Layard's Discoveries.

HOUSEHOLD WORDS—A journal conducted by Charles Dickens: American edition published by McElrath & Barker, 17 Spruce street, N. Y. This publication has a circulation in Great Britain of about 90,000, and is gaining a strong hold in this country. Dickens, as a writer of prolific genius stands acknowledged before the world: human nature in all its phases he understands, and with wonderful facility he turns it into effective interest to his host of admirers. Terms $2 per annum. Monthly Parts, 25 cents.

MECHANICS, INVENTORS, AND MANUFACTURERS.

SPLENDID PRIZES!

The first number of the *NINTH VOLUME* of the SCIENTIFIC AMERICAN will be issued on the 17th of September. We are grateful for the very liberal encouragement which we have received from our readers, and take this occasion to express to them our gratitude. We are also under many obligations to our cotemporaries for favorable notices.

The next volume will be commenced with *new and beautiful type*, printed on paper manufactured expressly for this publication, of *greatly increased weight and finer quality*: this item alone will increase our yearly expenses over $3000; in addition to this we shall increase our present able Editorial force as it is our intention to continue the Scientific American, "THE LEADING AND MOST RELIABLE PRACTICAL SCIENTIFIC JOURNAL IN THE UNITED STATES." It will continue the unflinching advocate of all *useful improvements*, and it will fearlessly expose all unreliable and deceptive schemes appertaining to its character; [in this respect it has gained a reputation superior to any other work of the kind in the world.]

The opening of the CRYSTAL PALACE in this city forms an object of rare public interest; we shall devote a full page of the paper every week to careful criticisms, reviews, and illustrations of the objects most worthy of attention. We hope to render this department especially interesting to all our readers, whether they visit the Fair or not. The copious and FINELY EXECUTED ENGRAVINGS of Machinery, New Inventions, etc.—the FOUR HUNDRED PAGES of valuable *Scientific and Practical Reading*—the USEFUL RECEIPTS—the *full Report* of all the PATENT CLAIMS, and the reliable character of the journal on all branches within its field of labor—render it worthy of the support which it has so liberally received from its intelligent class of readers.

The circulation of the Scientific American during the past year exceeded EIGHTEEN THOUSAND COPIES PER WEEK. The edition on the new volume will be commenced with *twenty-three thousand*, which we feel confident will not be an over calculation. Subscribers, to ensure the numbers from the commencement of the volume, should send in their subscriptions early, as many were disappointed in not obtaining the complete set of the present volume.

The Scientific American is in form SUITABLE FOR BINDING, and each volume is accompanied with a *full Index* of all the subjects, which renders it an ENCYCLOPEDIA OF USEFUL, SCIENTIFIC, and MECHANICAL INFORMATION, for present as well as future reference.

Hoping to stimulate our readers to greater activity in spreading the circulation of the Scientific American, we offer the following Splendid Prizes for the largest list of mail subscribers sent in by the first of January next.—

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$75	for the second largest list.
$50	for the third ditto.
$45	for the fourth ditto.
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$25	for the eighth ditto.
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$15	for the tenth ditto.
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The cash will be paid to the order of the successful competitors, immediately after January 1st, 1854.

These prizes are worthy of an honorable and energetic competition, and we hope our readers will not let an opportunity so favorable pass without attention.

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